CLUTCH SYSTEM

CL

CLUTCH SYSTEM > General Description

CAUTION

- When performing service operation, refer to "Repair Contents" in "General Description". Ref. to REPAIR CONTENTS>Repair Contents.
- Prior to starting work, pay special attention to the following:
  1. Always wear work clothes, a work cap, and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
  2. Protect the vehicle using a seat cover, fender cover, etc.
  3. Prepare the service tools, clean cloth, containers to catch grease and oil, etc.
- Prevent scattering of grease and oil. If it scatters, wipe it off immediately to prevent it from penetrating the floor or flowing out, to protect the environmental.
- If the grease and oil is spilt over the engine, exhaust pipe or the under cover, completely wipe it off to avoid emission of smoke or causing a fire.
- Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- When performing a repair, identify the cause of trouble and avoid unnecessary work.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground terminal from the battery sensor.
- Always use the jack-up point when the lifting device, shop jacks or rigid racks are used to support the vehicle.
- Before starting works, remove dirt and corrosion around the target area.
- Keep the removed parts in order and protect them from dust and dirt.
- All removed parts, if to be reused, should be reinstalled in the original positions with attention to the correct directions, etc.
- For the parts except for the non-reusable parts, replace then with new parts if necessary.
- Be sure to tighten bolts and nuts to the specified torque.

CLUTCH SYSTEM > General Description

SPECIFICATION

1. CLUTCH COVER

Type		Dry, single plate, diaphragm spring type
Set load	N (kgf, lbf)	5895 (601.1, 1325.4)

2. CLUTCH DISC

Facing material			Semi-mold
O.D. × I.D. × Thickness	mm (in)	Flywheel side	230.0 × 155.0 × 3.2 (9.06 × 6.10 × 0.13)
		Clutch cover side	230.0 × 155.0 × 3.5 (9.06 × 6.10 × 0.14)
Spline outer diameter	mm (in)		25.2 (0.99)
Number of teeth			24
Depth of rivet head	mm (in)	Limit of sinking	0.8 (0.03)
Limit of runout	mm (in)		0.7 (0.03)

3. RELEASE LEVER

Lever ratio	1.598

4. CLUTCH PEDAL

Full stroke	mm (in)	115 (4.5)
Free play	mm (in)	4.3 — 16.4 (0.17 — 0.65)

5. FLYWHEEL

Type	Flexible

6. CLUTCH FLUID

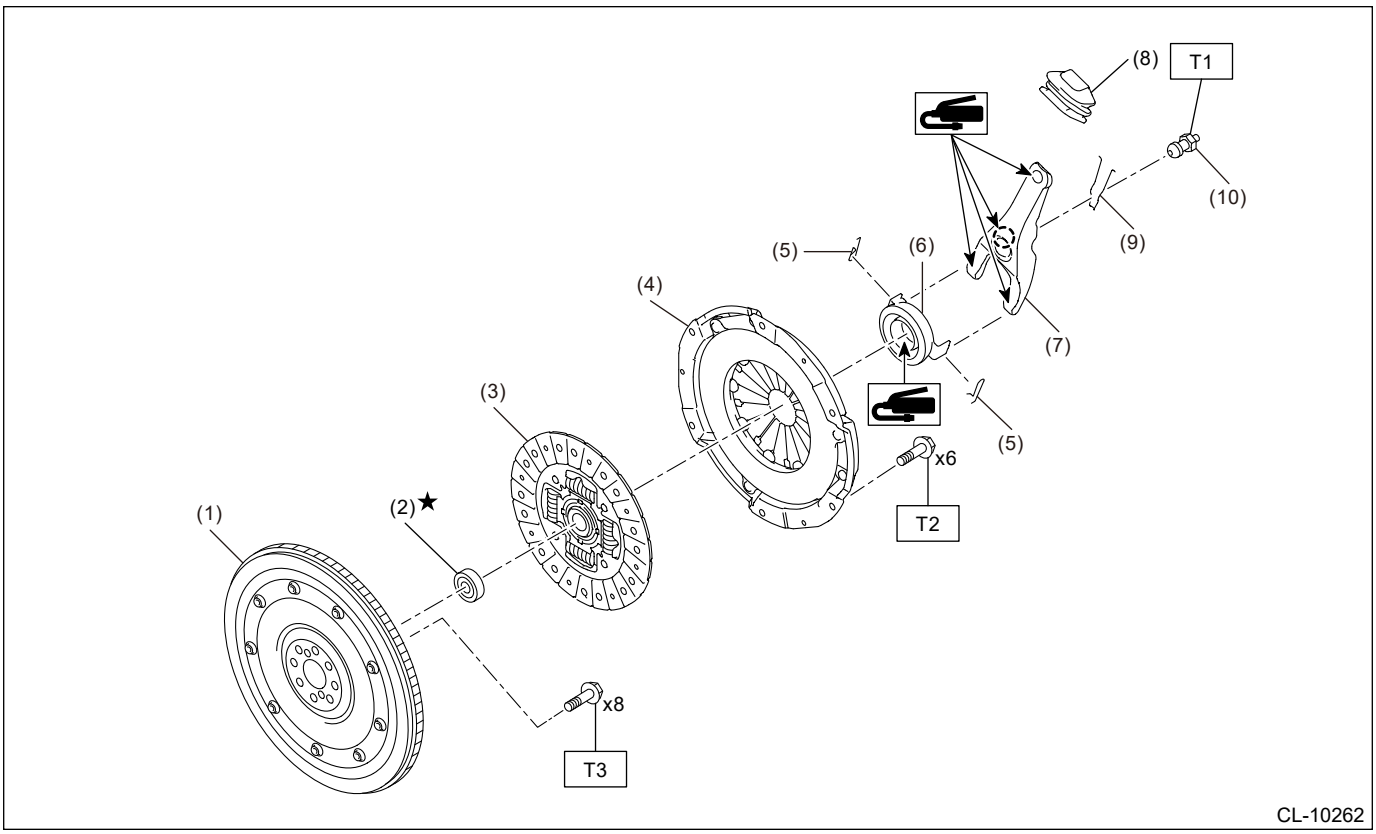
Caution:
- **Do not let clutch fluid come into contact with the painted surface of the vehicle. Wash away with water immediately and wipe off if it is spilled by accident.**
- **Do not mix different kinds of clutch fluid.**
- **Do not allow water or foreign matter to enter the reservoir tank.**
- **Always use new clutch fluid when replacing or refilling the clutch fluid.**

Recommended and alternative materials
• Recommended materials: FMVSS No. 116 DOT3 or DOT4

CLUTCH SYSTEM > General Description

COMPONENT

1. CLUTCH ASSEMBLY



(1) Flywheel
(2) Pilot bearing
(3) Clutch disc
(4) Clutch cover
(5) Clip
(6) Release bearing
(7) Release lever
(8) Dust cover
(9) Lever spring
(10) Pivot

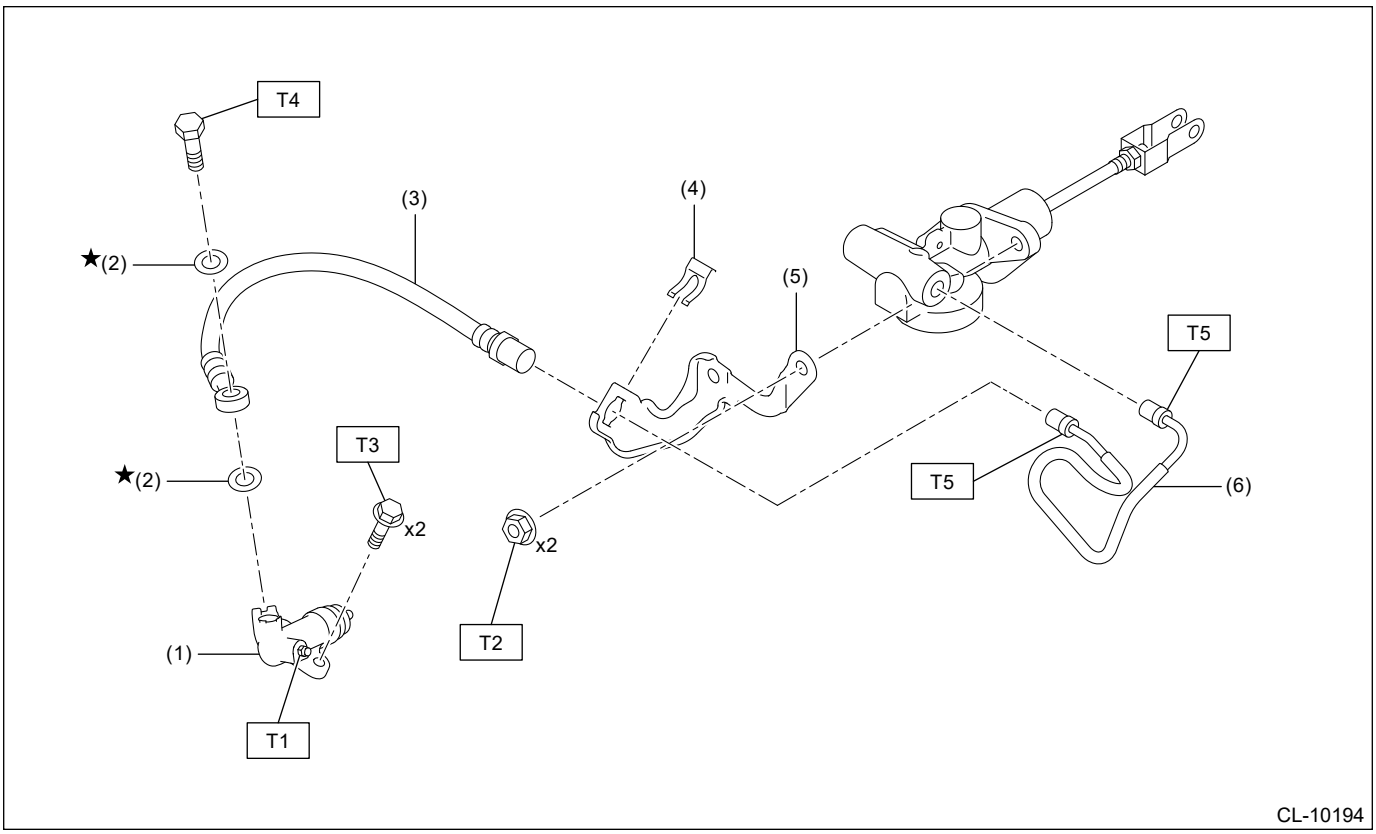
Tightening torque: N·m (kgf-m, ft-lb)

T1: 16 (1.6, 11.8)

T2: Ref. to CLUTCH SYSTEM>Clutch Disc and Cover>INSTALLATION.

T3: Ref. to CLUTCH SYSTEM>Flywheel>INSTALLATION.

2. CLUTCH PIPE AND HOSE

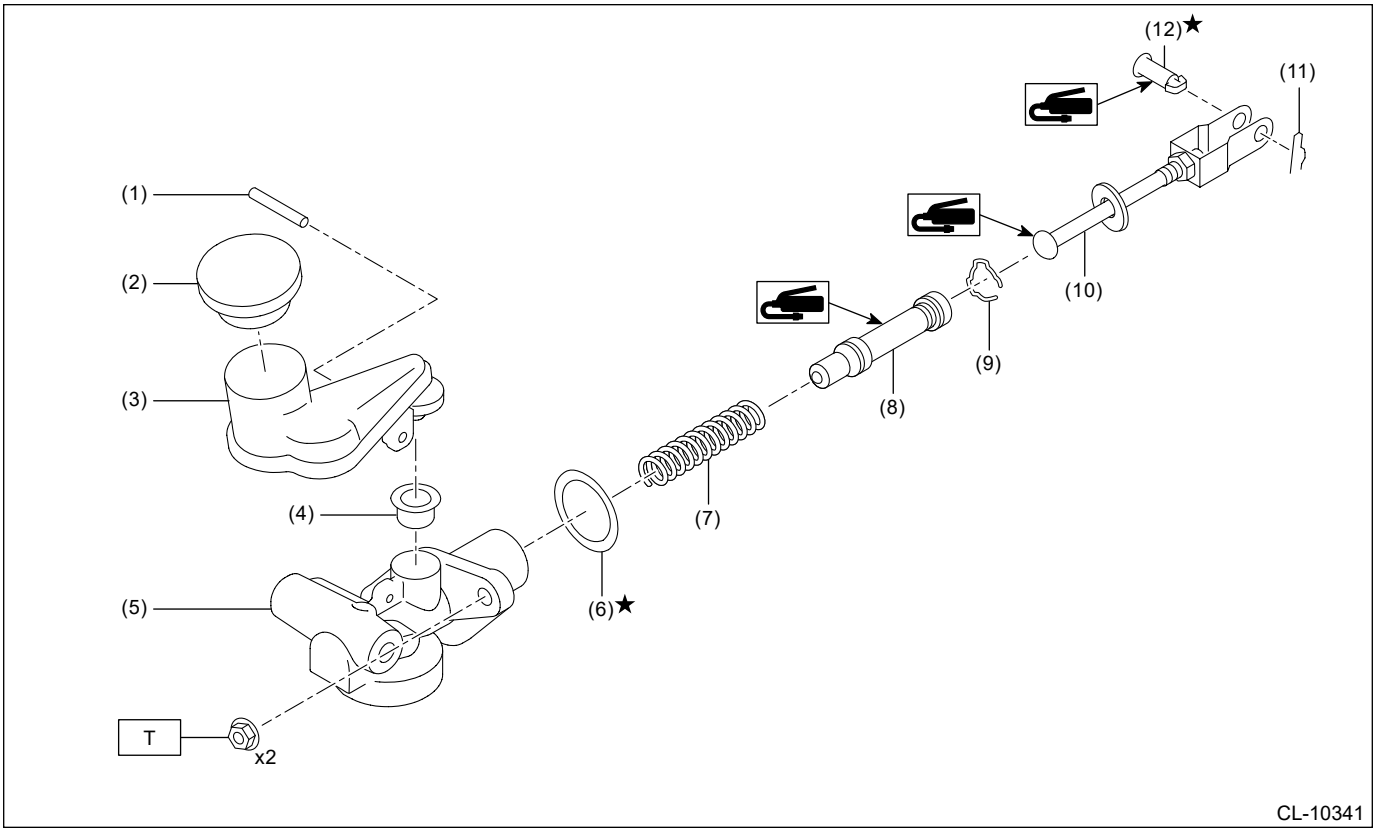


(1) Operating cylinder
(2) Gasket
(3) Clutch hose
(4) Clip
(5) Hose bracket
(6) Clutch pipe

Tightening torque: N·m (kgf-m, ft-lb)

T1: 7.8 (0.8, 5.8)
T2: 18 (1.8, 13.3)
T3: 37 (3.8, 27.3)
T4: Ref. to CLUTCH SYSTEM>Operating Cylinder>INSTALLATION.
T5: Ref. to CLUTCH SYSTEM>Clutch Pipe and Hose>INSTALLATION.

3. MASTER CYLINDER



(1)	Pin*	(6)	Seat	(11)	Snap pin
(2)	Reservoir tank cap	(7)	Spring	(12)	Clevis pin
(3)	Reservoir tank*	(8)	Piston		
(4)	Seal reservoir	(9)	Snap ring	***Tightening torque: N·m (kgf-m, ft-lb)***	
(5)	Master cylinder*	(10)	Push rod*	***T: 18 (1.8, 13.3)***	

*: The pin, reservoir tank, master cylinder, and push rod are set parts.

4. CLUTCH PEDAL

For an exploded view of the clutch pedal, refer to “Brake Pedal”. Ref. to BRAKE>General Description>COMPONENT > BRAKE PEDAL.

CLUTCH SYSTEM > General Description

PREPARATION TOOL

1. SUBARU SPECIAL TOOL

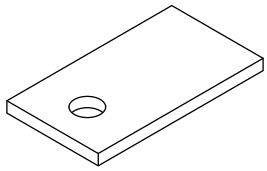
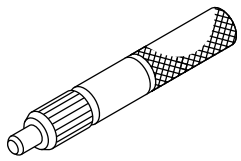
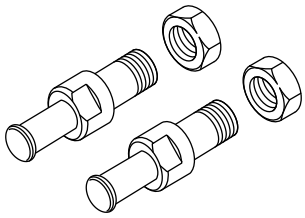
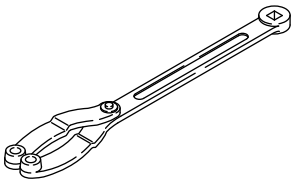
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498255400	498255400	PLATE	Used for measuring clutch disc run-out.
 ST-499747100	499747100	CLUTCH DISC GUIDE	Used for installing the clutch disc.
 ST18334AA000	18334AA000	PULLEY WRENCH PIN SET	Used for removing and installing flywheel. **Note:** **Used together with PULLEY WRENCH (18355AA000).**
 ST18355AA000	18355AA000	PULLEY WRENCH	Used for removing and installing flywheel. **Note:** **Used with PULLEY WRENCH PIN SET (18334AA000).**

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** • **For detailed operation procedures, refer to "Help" of application.** • **Used together with interface for Subaru Select Monitor (such as DST-i and DST-010).**

2. OTHER

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Magnet stand	Used for measuring clutch disc run-out. **Note:** **Used together with the dial gauge (spindle type).**
DIAL GAUGE (spindle type)	Used for measuring clutch disc run-out. **Note:** **Used together with magnet stand.**
Depth gauge or caliper gauge	Used for measuring the remaining amount of clutch disc.
Crowfoot wrench (10 mm)	Used for installing the clutch pipe.

CLUTCH SYSTEM > Clutch Disc and Cover

REMOVAL

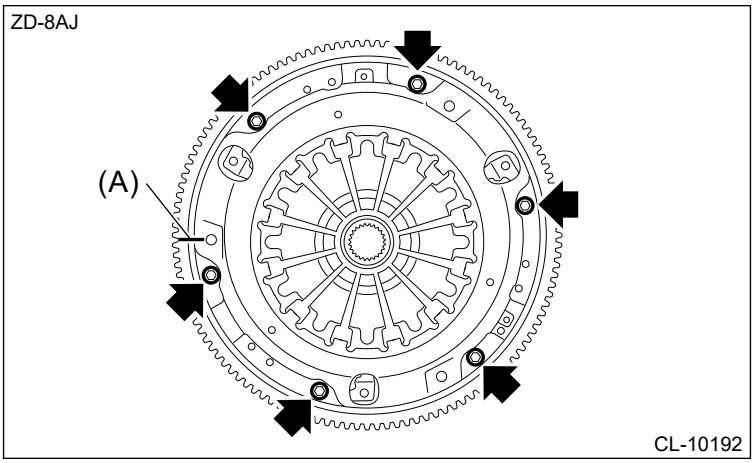
SUBARU SST

Note:
The clutch cover and clutch disc cannot be disassembled.

1. Remove the transmission body. Ref. to MANUAL TRANSMISSION>Transmission Assembly>REMOVAL.
2. Remove the release bearing and release lever. Ref. to CLUTCH SYSTEM>Release Bearing and Lever>REMOVAL.
3. Mark an alignment mark (A) on the clutch cover and flywheel.

   Note:
   This operation is required only when reusing the existing clutch cover and flywheel.
4. Remove the clutch cover and clutch disc.

   Caution:
   - **Be careful not to drop the clutch disc.**
   - **Do not wash the pilot bearing since it is filled with grease.**



CLUTCH SYSTEM > Clutch Disc and Cover

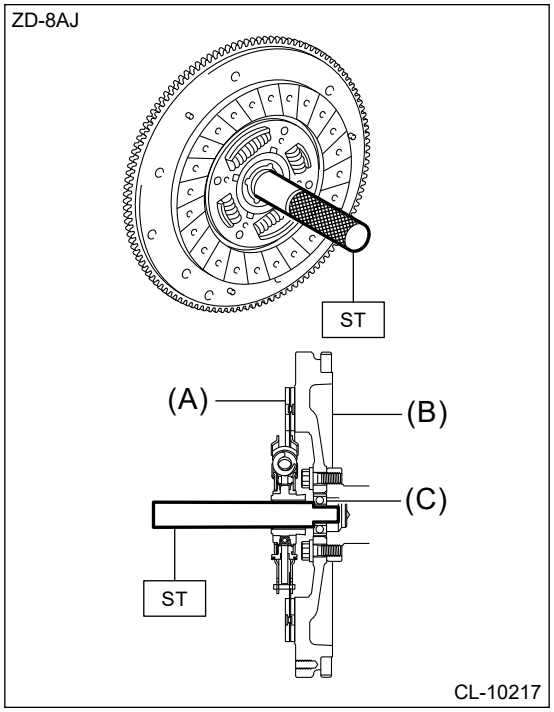
INSTALLATION

1. Set the ST and clutch disc.

   Caution:
   Install the clutch disc so that its part number is on the transmission side.

   Note:
   - **Center the clutch disc.**
   - **Before installing the clutch disc, check its facing surface, the pressure plate, and the flywheel for foreign matter adhesion.**

   Preparation tool:
   ST: CLUTCH DISC GUIDE (499747100)

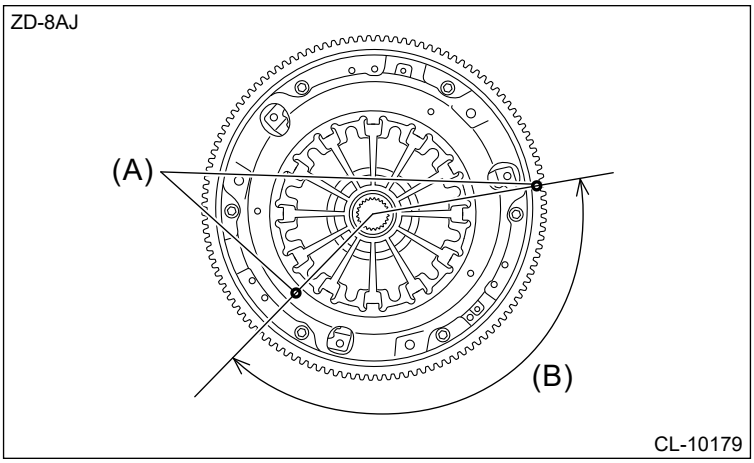


(A) Clutch disc (B) Flywheel (C) Pilot bearing

2. Temporarily install the clutch cover.

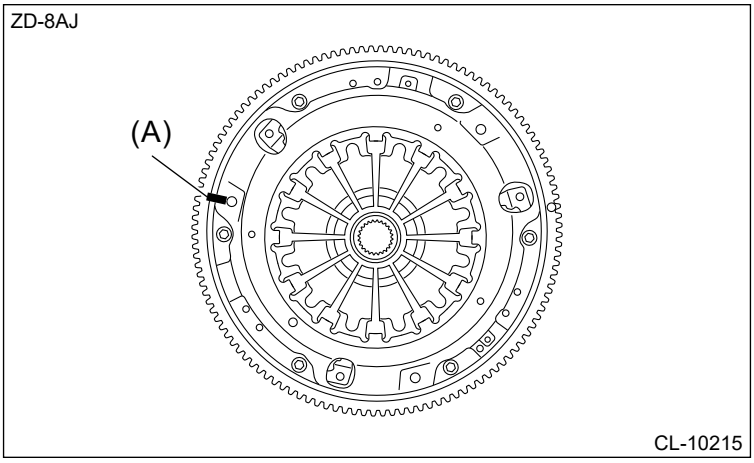
Note:
Temporarily install the bolts with your hand.

- When replacing the existing flywheel and clutch cover with new ones



(A) Imbalance mark (B) 120 ° or more

- When reusing the existing flywheel and clutch cover

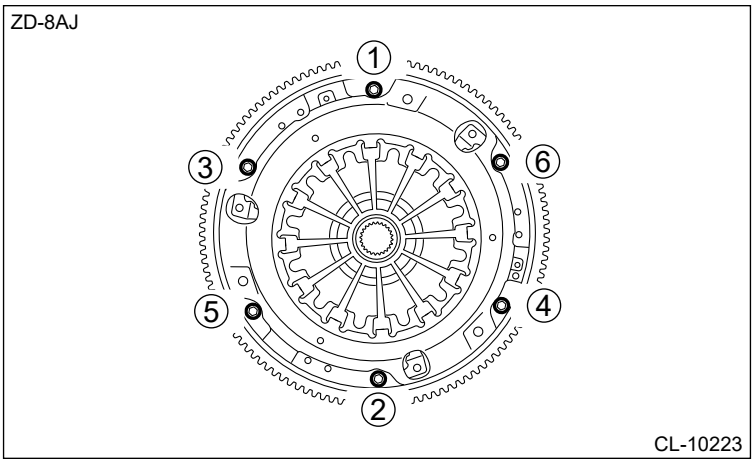


(A) Alignment mark

3. Tighten the bolts in the numerical order as shown in the figure.

Note:
- **Equally tighten the bolts several times.**
- **To prevent the clutch disc from moving from the center, adjust its position by using the ST (CLUTCH DISC GUIDE).**

Tightening torque:
16 N·m (1.6 kgf-m, 11.8 ft-lb)



4. Remove the ST (CLUTCH DISC GUIDE).
5. Install the release bearing and release lever. Ref. to CLUTCH SYSTEM>Release Bearing and Lever>INSTALLATION.
6. Install the transmission body. Ref. to MANUAL TRANSMISSION>Transmission Assembly>INSTALLATION.

CLUTCH SYSTEM > Clutch Disc and Cover

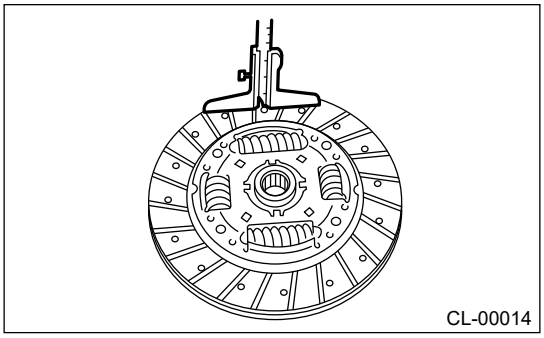
INSPECTION

1. CLUTCH DISC

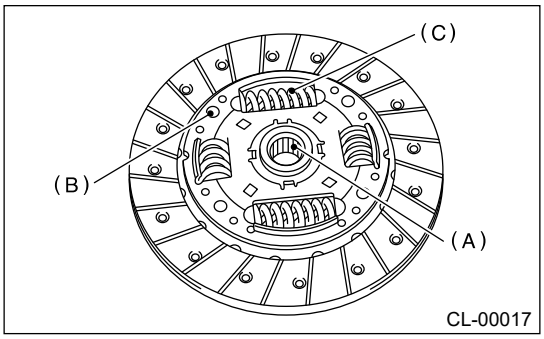
1. Check the facing surface for foreign matter adhesion.
2. Measure the depth from the facing surface to the rivet head by using a depth gauge or caliper gauge.

Service limit:

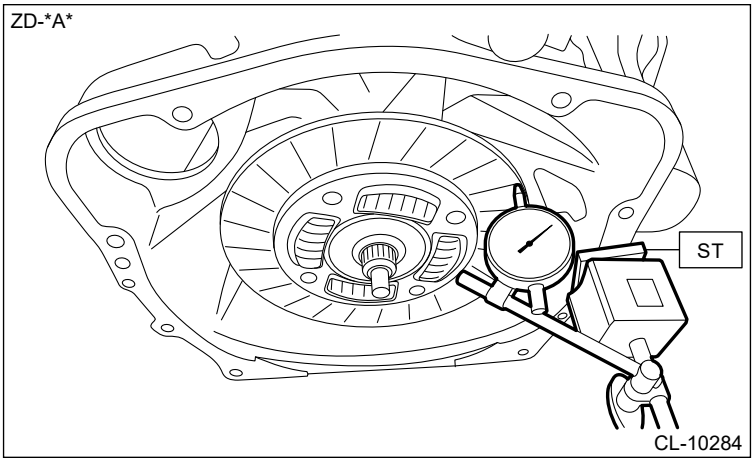
0.8 mm (0.03 in)



3. Check the spline portion (A) for excessive or uneven wear.
4. Check rivet (B) for looseness.
5. Check the damper spring (C) for deformations or breakage.



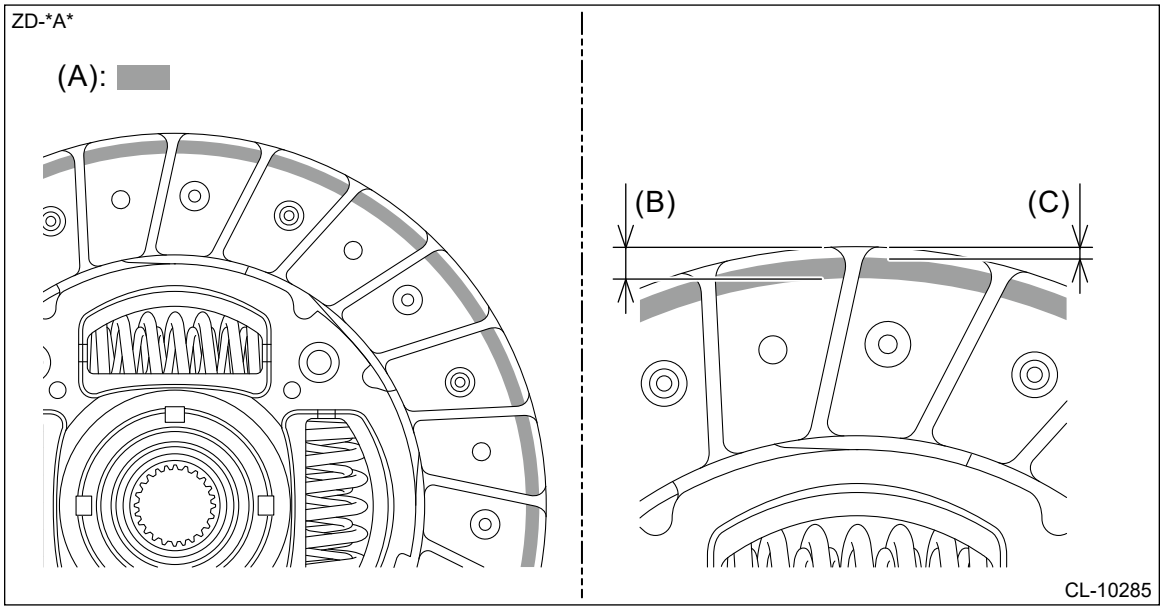
6. Check the clutch disc runout.
   (1) Check the spline portion of the input shaft. Ref. to MANUAL TRANSMISSION>Transmission Assembly>INSPECTION.
   (2) Install the clutch disc to the input shaft.
   (3) Set the ST, magnet stand, and dial gauge (spindle type).
   Preparation tool:
   ST: PLATE (498255400)



   (4) Place the dial gauge (spindle type) 3 — 5 mm (0.1 — 0.2 in) from the outer periphery of the clutch disc.
   (5) Slowly rotate the input shaft with your hand once, and measure the clutch disc runout.

Note:
- **During the measurement, be careful not to come in contact with burrs, scratches, other damage.**
- **Measure only the facing surface.**

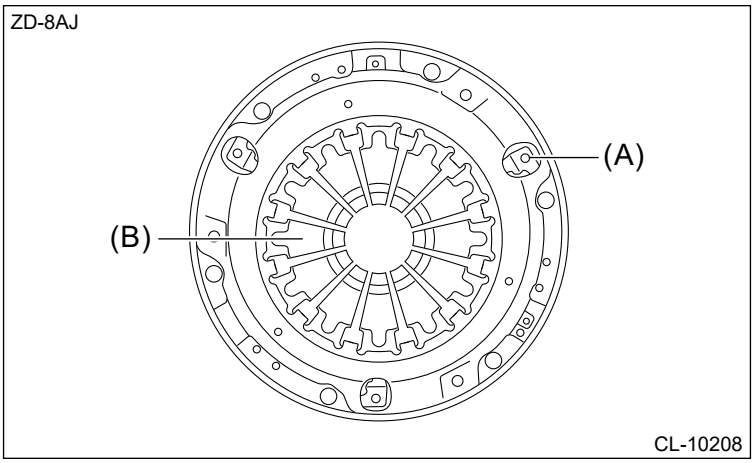
Limit (difference between maximum value and minimum value):
0.7 mm (0.03 in)



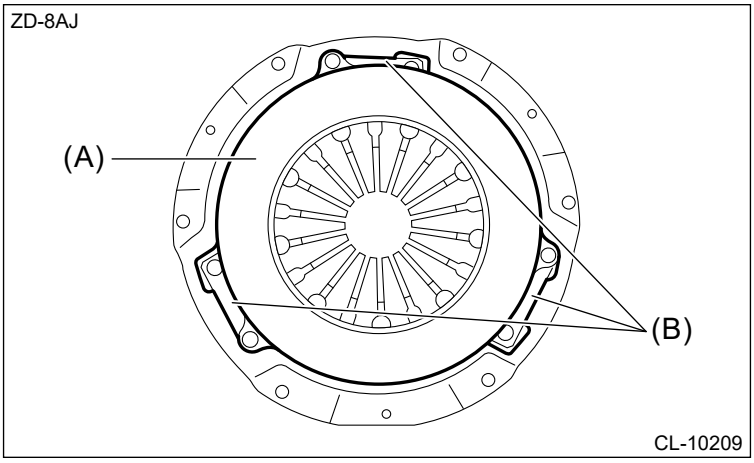
(A) Measuring point (B) 5 mm (0.2 in) (C) 3 mm (0.1 in)

2. CLUTCH COVER

1. Check that there is no deformation, cracks or other damages.
2. Check the thrust rivet (A) for looseness.
3. Check the release bearing contact area of the diaphragm spring (B) for excessive wear.



4. Check the clutch disc contact area of the pressure plate (A) for excessive wear.
5. Check the mounting portion of the strap plate (B) for looseness.


ZD-8AJ
(A)
(B)
CL-10209

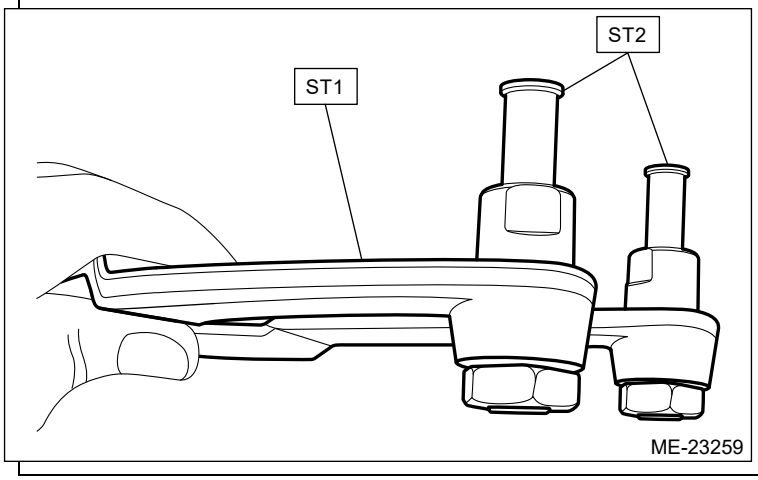
CLUTCH SYSTEM > Flywheel

REMOVAL

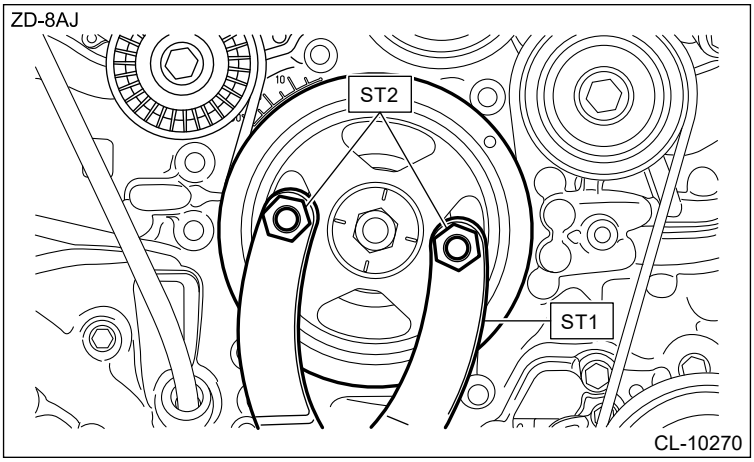
Caution:
Do not wash the pilot bearing since it is filled with grease.

1. Remove the transmission body. Ref. to MANUAL TRANSMISSION>Transmission Assembly>REMOVAL.
2. Remove the clutch disc and clutch cover. Ref. to CLUTCH SYSTEM>Clutch Disc and Cover>REMOVAL.
3. Secure the crank pulley with the ST1 and ST2.

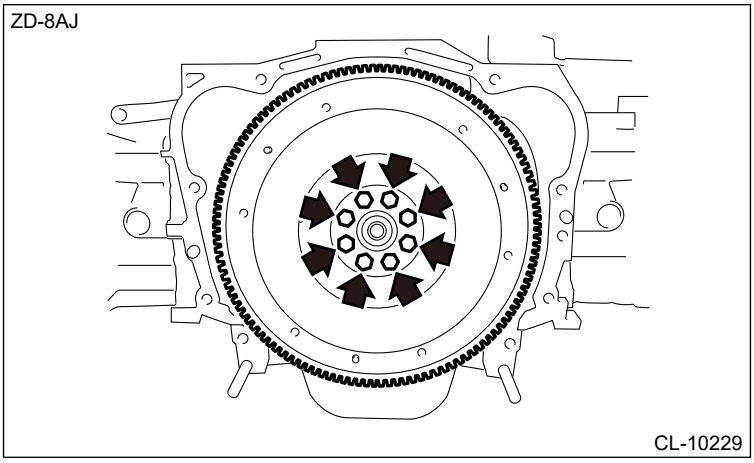
Note:
To prevent damaging ST1, attach the ST2 onto the ST1 as shown in the figure.



Preparation tool:
ST1: PULLEY WRENCH (18355AA000)
ST2: PULLEY WRENCH PIN SET (18334AA000)

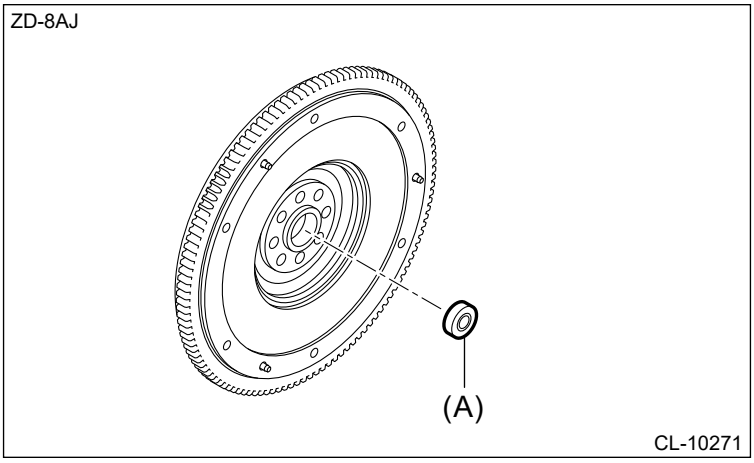


4. Remove the flywheel and crankshaft position sensor plate.



5. Drive out the pilot bearing.

Note:
Perform this procedure only when required.



(A) Pilot bearing

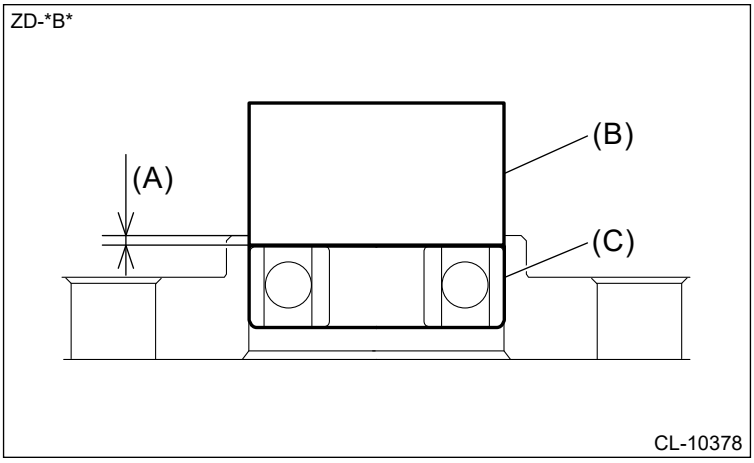
CLUTCH SYSTEM > Flywheel

INSTALLATION

1. Press-fit a new pilot bearing using a press and an attachment of a suitable size, etc.

Caution:
- **Make sure the pilot bearing is not slanted.**
- **Be sure to push the outer race.**

Press-fit depth from the end surface of the flywheel:
0 — 0.4 mm (0 — 0.02 in)

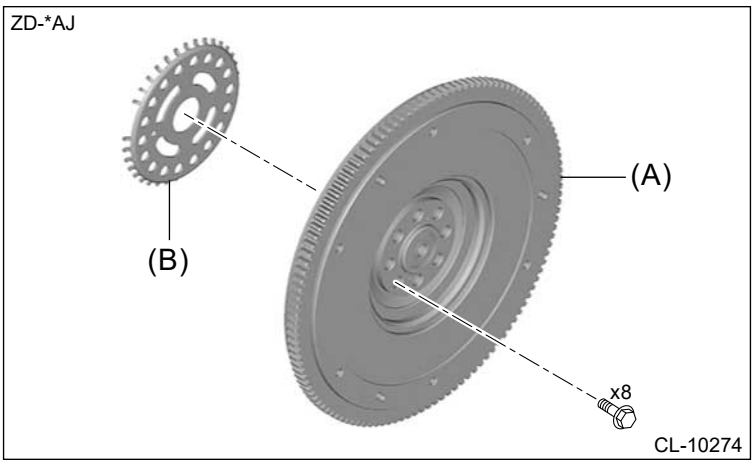


(A) 0 — 0.4 mm (0 — 0.02 in) (B) Attachment (C) Pilot bearing

2. Temporarily install the flywheel and crankshaft position sensor plate.

Caution:
Install with the stamped mark of the crankshaft position sensor plate facing the transmission side.

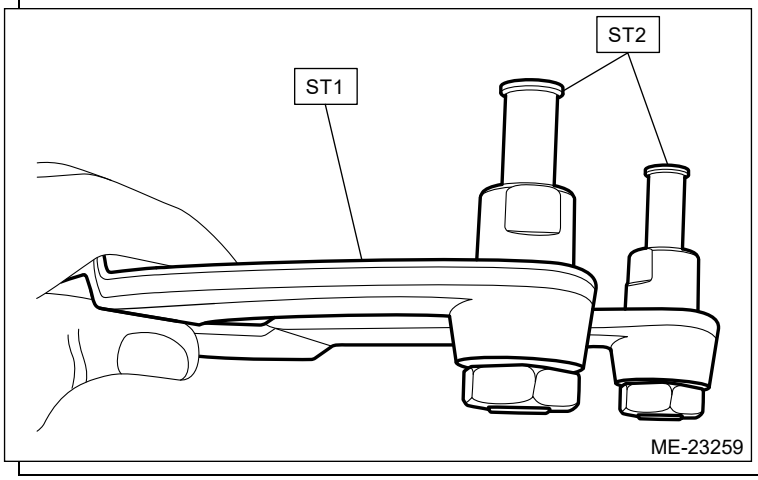
Note:
Align the knock pin hole of the crankshaft position sensor plate to the knock pin of the crankshaft to secure the knock pin.



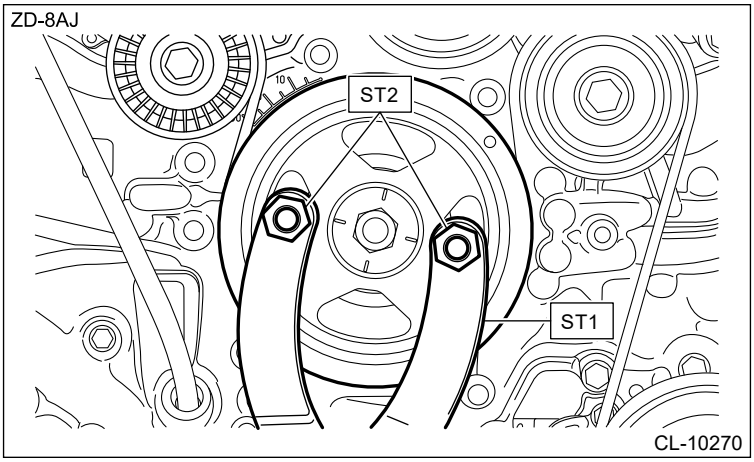
(A) Flywheel (B) Crankshaft position sensor plate

3. Secure the crank pulley with the ST1 and ST2.

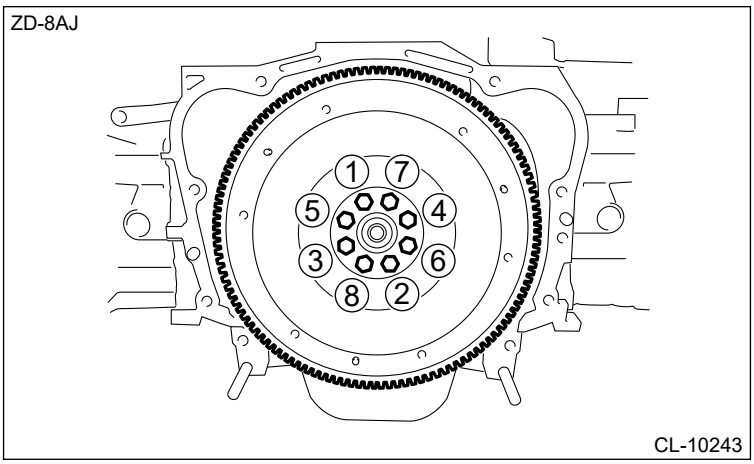
Note:
To prevent damaging ST1, attach the ST2 onto the ST1 as shown in the figure.



Preparation tool:
ST1: PULLEY WRENCH (18355AA000)
ST2: PULLEY WRENCH PIN SET (18334AA000)



4. Tighten the bolts in the numerical order as shown in the figure.
Tightening torque:
85 N·m (8.7 kgf-m, 62.7 ft-lb)



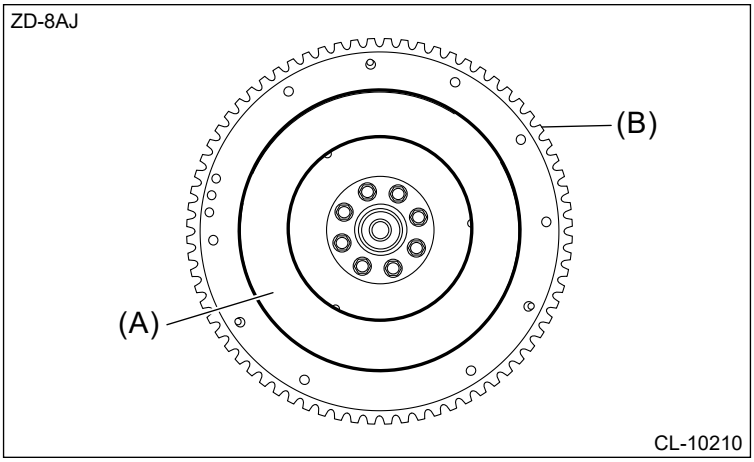
5. Install the clutch disc and clutch cover. Ref. to CLUTCH SYSTEM>Clutch Disc and Cover>INSTALLATION.

6. Install the transmission body. Ref. to MANUAL TRANSMISSION>Transmission Assembly>INSTALLATION.

CLUTCH SYSTEM > Flywheel

INSPECTION

1. Check that there is no deformation, cracks or other damages.
2. Check the clutch disc contact area (A) for excessive or uneven wear.
3. Check the ring gear (B) for excessive wear.

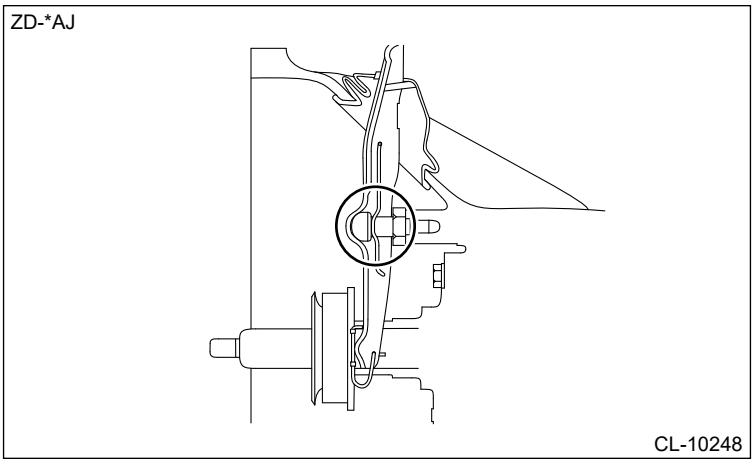


4. Check the bearing for smooth rotation.
5. Check the bearing for looseness.

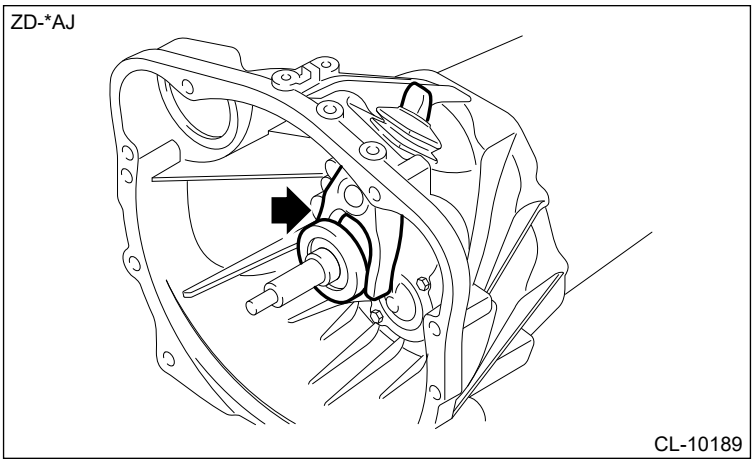
CLUTCH SYSTEM > Release Bearing and Lever

REMOVAL

1. Remove the transmission body. Ref. to MANUAL TRANSMISSION>Transmission Assembly>REMOVAL.
2. Disengage the lever spring and pivot.

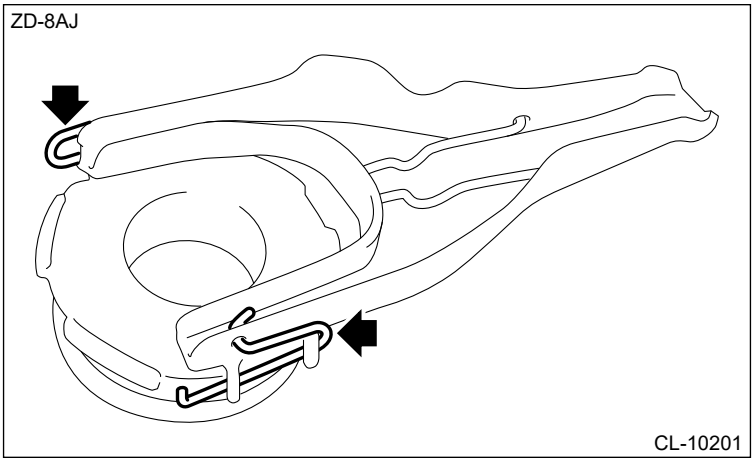


3. Remove the release lever and release bearing as a unit.

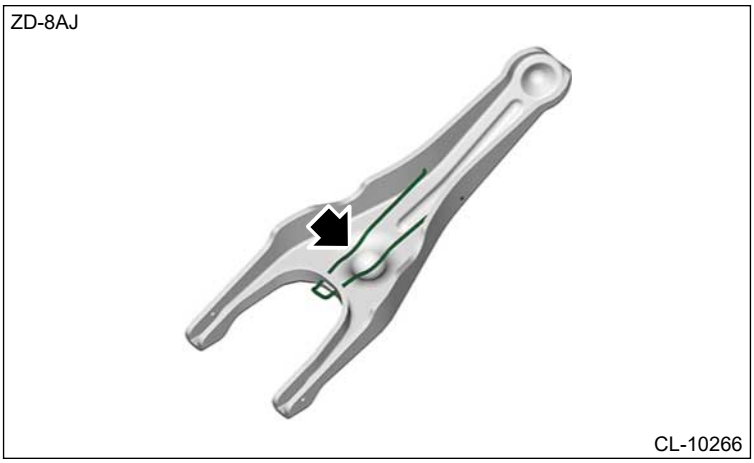


4. Clean the input shaft and pivot.
5. Remove the clip, and then remove the release bearing.

Caution:
Be careful not to deform the clips.



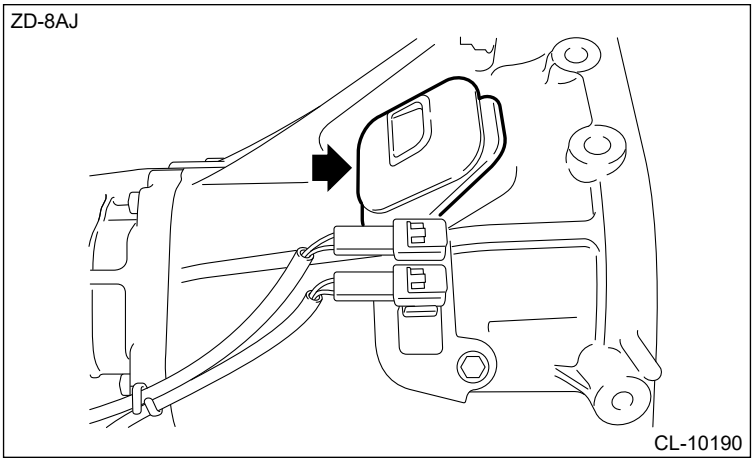
6. Remove the lever spring from the release lever.



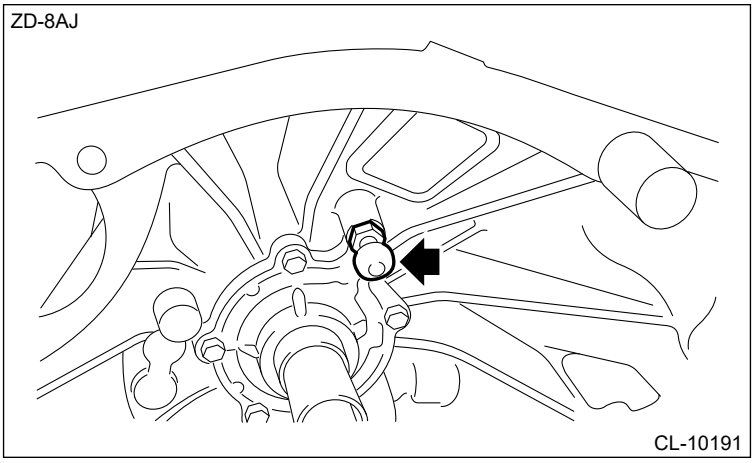
7. Clean the release lever and release bearing.

Caution:
Do not wash the release bearing since it is filled with grease.

8. Remove the dust cover.



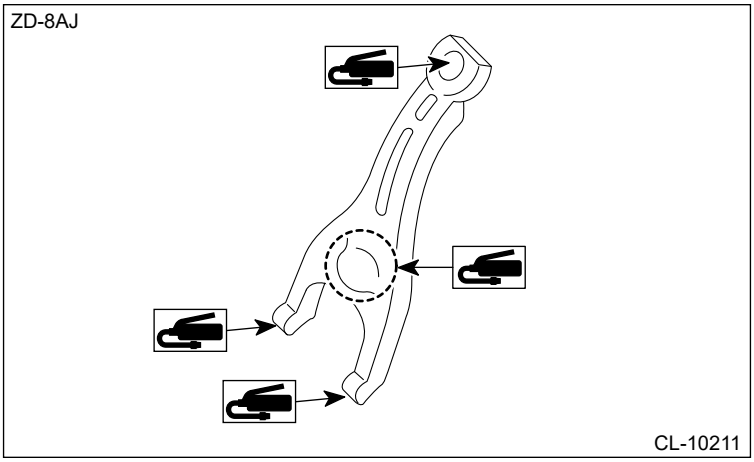
9. Remove the pivot.



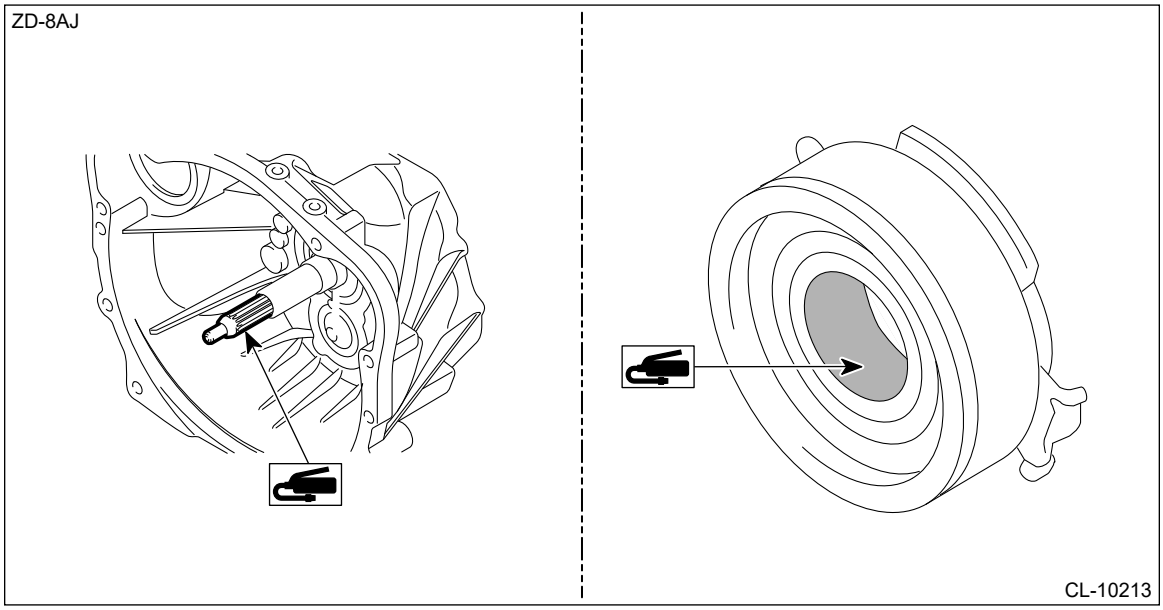
CLUTCH SYSTEM > Release Bearing and Lever

INSTALLATION

1. Install the pivot.
   Tightening torque:
   16 N·m (1.6 kgf-m, 11.8 ft-lb)
2. Install the dust cover.
3. Install the lever spring to the release lever.
4. Apply grease to the release lever.
   Preparation items:
   Grease: NICHIMOLY N-130 or equivalent



5. Install the release bearing to the release lever.
6. Apply grease to the spline portion of the input shaft and inner periphery of the release bearing.
   Preparation items:
   Grease: NICHIMOLY N-130 or equivalent



7. Install the release bearing and release lever as a unit.

Note:
- **Make sure the lever spring is engaged with the pivot.**
- **After installing the parts, move the release lever back and forth and check if the release bearing moves smoothly.**

8. Install the transmission body. Ref. to MANUAL TRANSMISSION>Transmission Assembly>INSTALLATION.

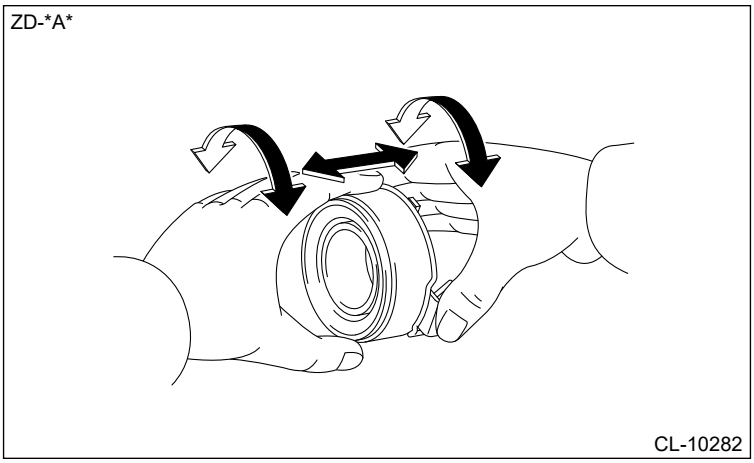
CLUTCH SYSTEM > Release Bearing and Lever

INSPECTION

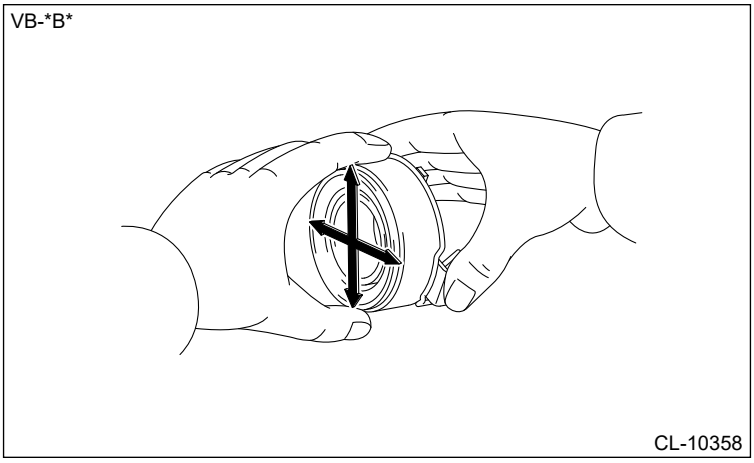
1. RELEASE BEARING

1. Check that there is no deformation, cracks or other damages.
2. Check the release lever contact area for excessive wear.
3. Check the bearing for smooth rotation.

Note:
Rotate the bearing while applying pressure in the thrust direction.

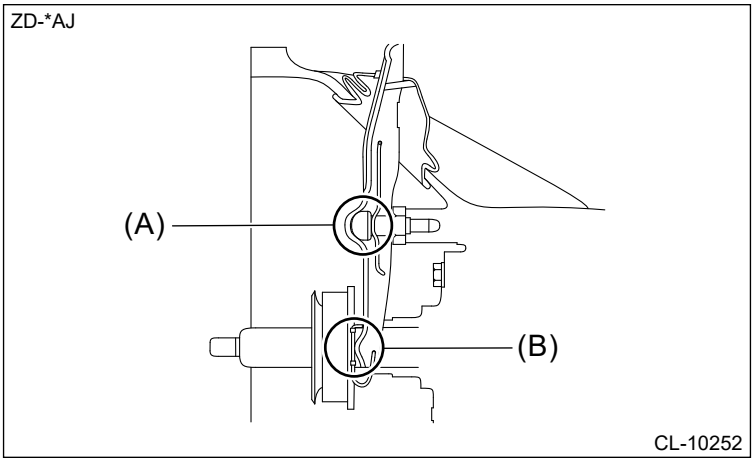


4. Check the bearing for looseness in the radial direction.
   Specification:
   1.6 mm (0.06 in)



2. RELEASE LEVER

1. Check that there is no deformation, cracks or other damages.
2. Check the pivot contact area (A) and the release bearing contact area (B) for excessive wear.



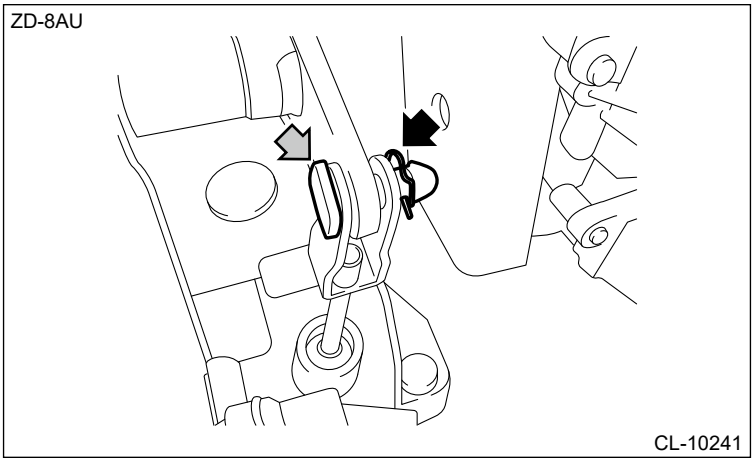
CLUTCH SYSTEM > Master Cylinder

REMOVAL

Caution:

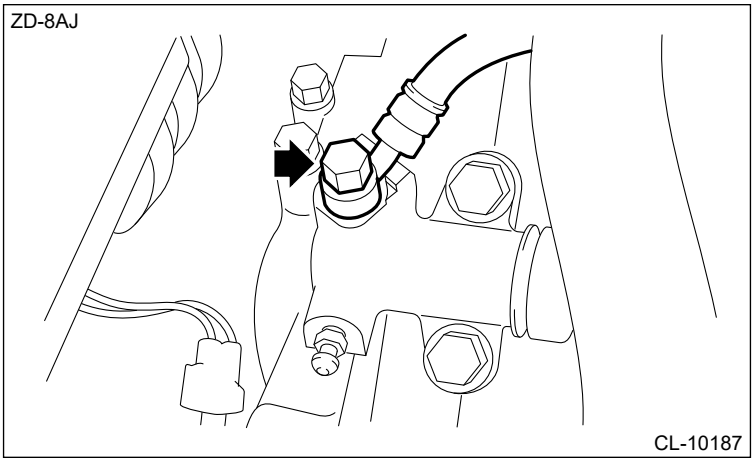
- **Do not let clutch fluid come into contact with the painted surface of the vehicle. Wash away with water immediately and wipe off if it is spilled by accident.**
- **Remove the master cylinder, hose bracket, clutch pipe, and clutch hose as a unit. If you remove the clutch pipe and clutch hose with the master cylinder installed to the vehicle, the clutch hose bracket may get deformed.**
- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**

1. Disconnect the ground terminal from the battery sensor, and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover LWR driver INN and cover LWR driver OUT. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Remove the snap pin and clevis pin, and then separate the push rod from the master cylinder lever.

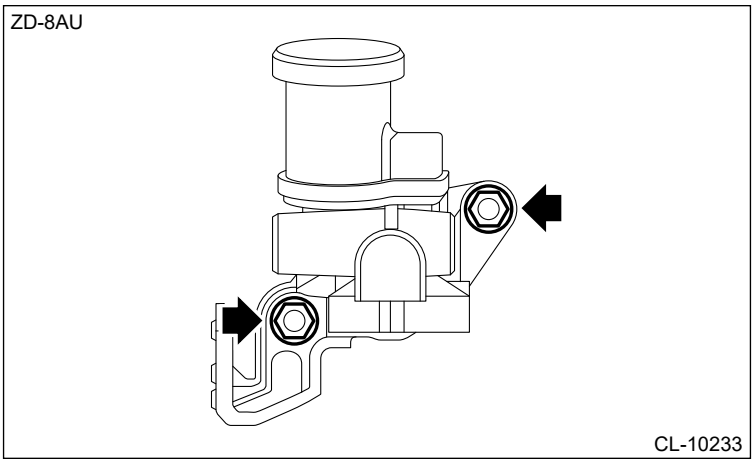


4. Disconnect the clutch hose.

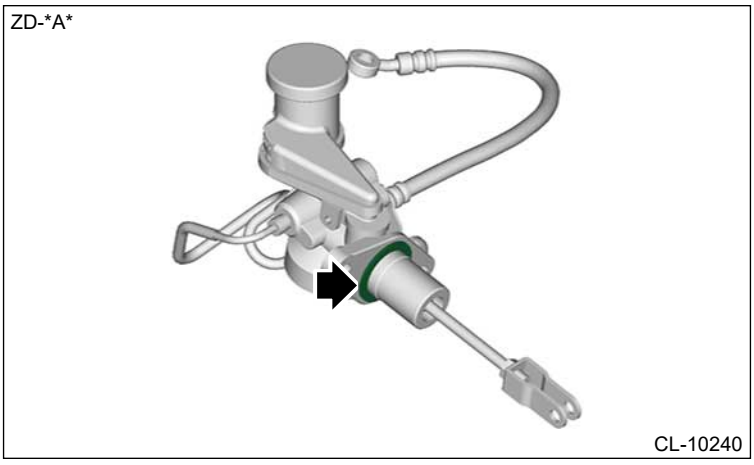
Note:
Prepare the container for collecting the clutch fluid.



5. Remove the hose bracket, clutch pipe, clutch hose, master cylinder, and seat as a unit.



6. Remove the seat.



CLUTCH SYSTEM > Master Cylinder

INSTALLATION

1. Set the seat to the master cylinder.

Caution:
Always use a new seat.

2. Install the hose bracket, clutch pipe, clutch hose, master cylinder, and seat as a unit.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)

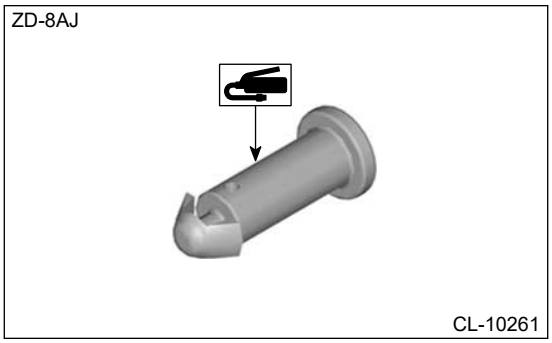
3. Apply grease to the outer periphery of the clevis pin.

Caution:

Always use a new clevis pin.

Preparation items:

Grease: NIPPON GREASE NIGTIGHT LTS No. 2 or equivalent



4. Align the holes on the master cylinder lever and push rod, and install the clevis pin and snap pin.

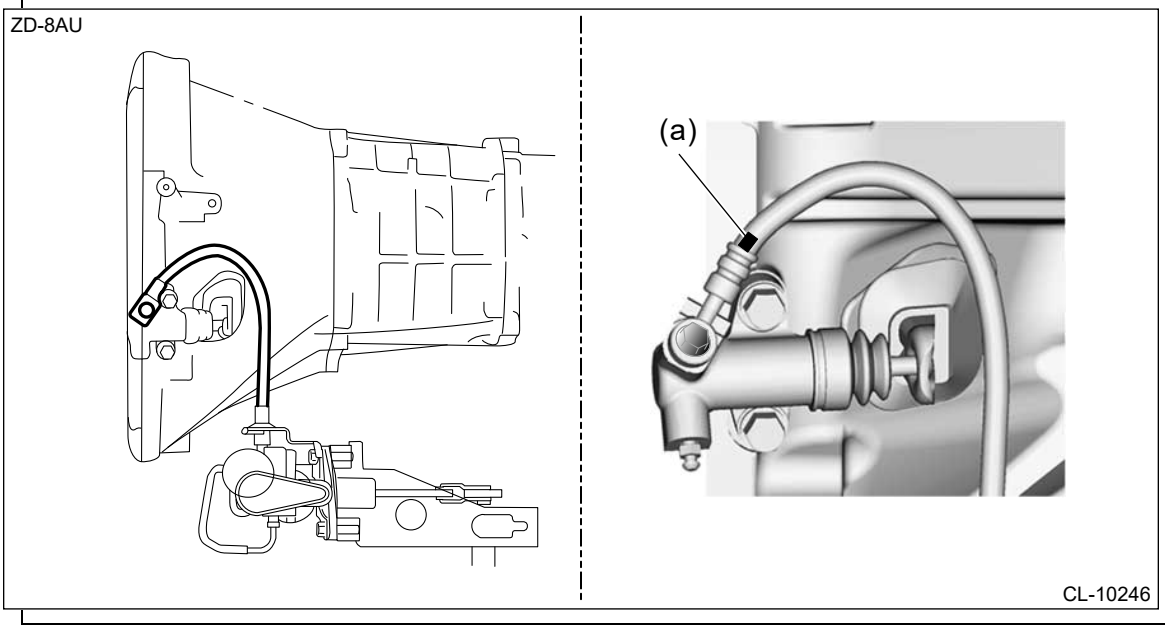
Note:

Insert the clevis pin from the left side of vehicle.

5. Using a new gasket, connect the clutch hose.

Note:

- **Install the clutch hose while making sure that it hangs loose to the rear of the vehicle.**
- **Face the mark (a) of the clutch hose in the top direction.**



Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)

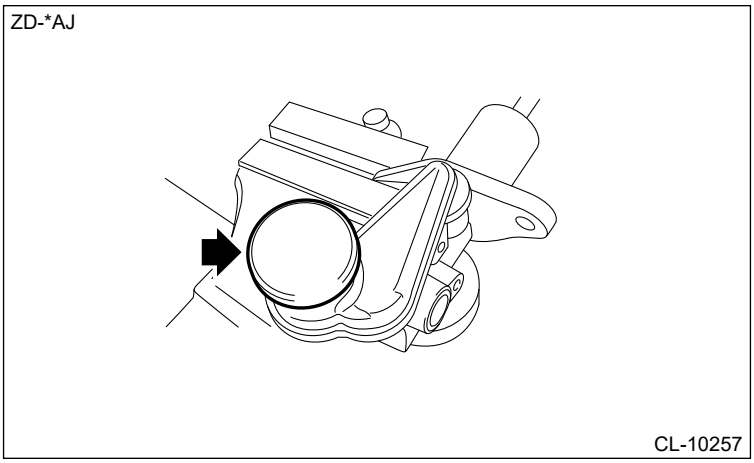
6. Bleed air from the clutch fluid. Ref. to CLUTCH SYSTEM>Air Bleeding>PROCEDURE.
7. Check the full stroke of the clutch pedal. Ref. to CLUTCH SYSTEM>Clutch Pedal>INSPECTION.
8. Install the cover LWR driver INN and cover LWR driver OUT. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>INSTALLATION.
9. Connect the ground terminal to battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

CLUTCH SYSTEM > Master Cylinder

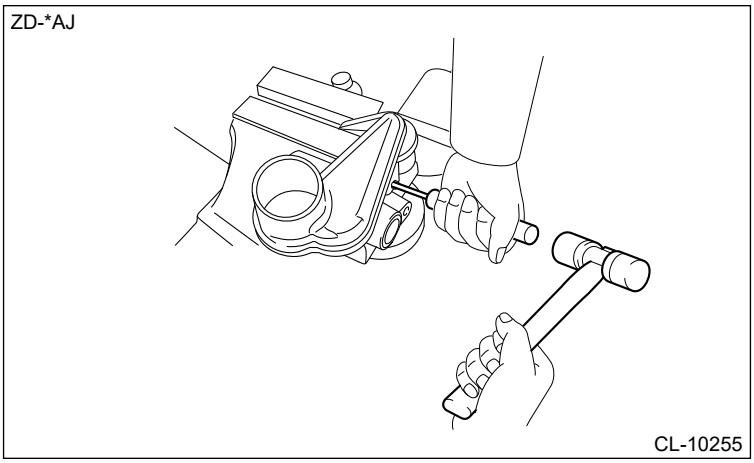
DISASSEMBLY

Caution:
- **When using a vise, place aluminum plates or wooden pieces between the contacting surfaces between the vise and the master cylinder to prevent master cylinder damage.**
- **When using a vise, be careful not to clamp the cylinder portion as that can cause the master cylinder to get deformed.**

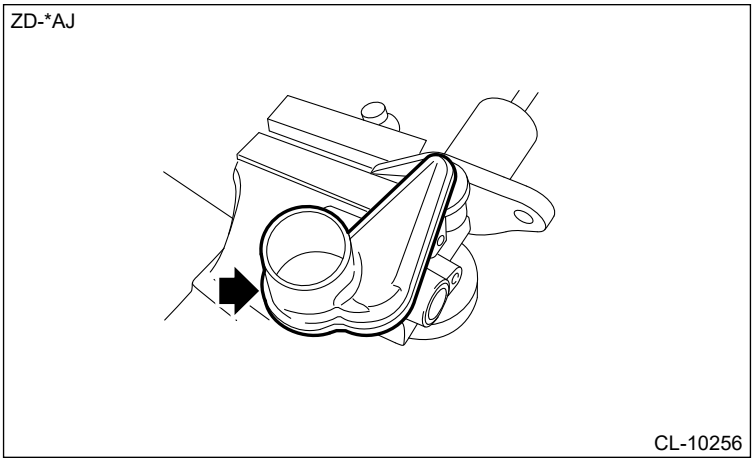
1. Remove the clutch hose and clutch pipe. Ref. to CLUTCH SYSTEM>Clutch Pipe and Hose>REMOVAL.
2. Remove the reservoir tank cap.



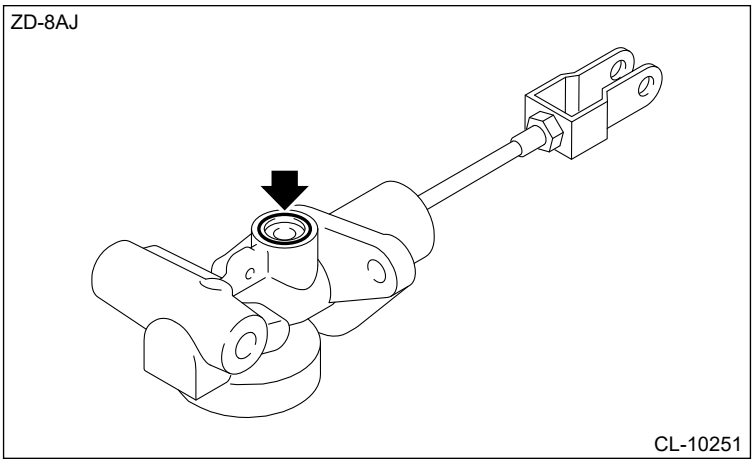
3. Use a pin punch and a hammer to remove the pin.



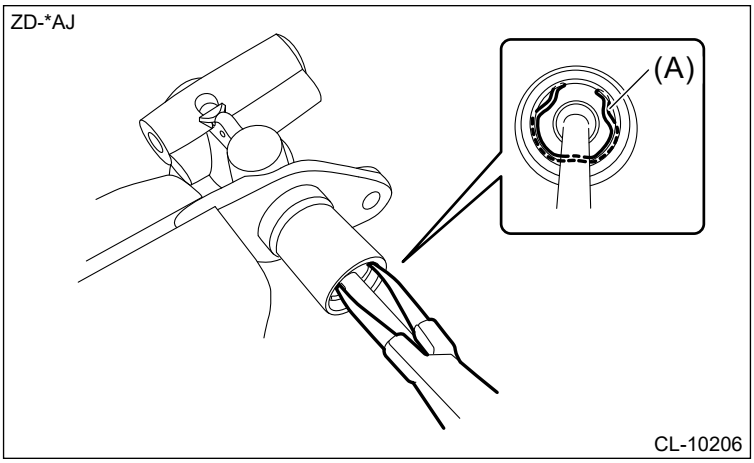
4. Remove the reservoir tank.



5. Remove the seal reservoir.

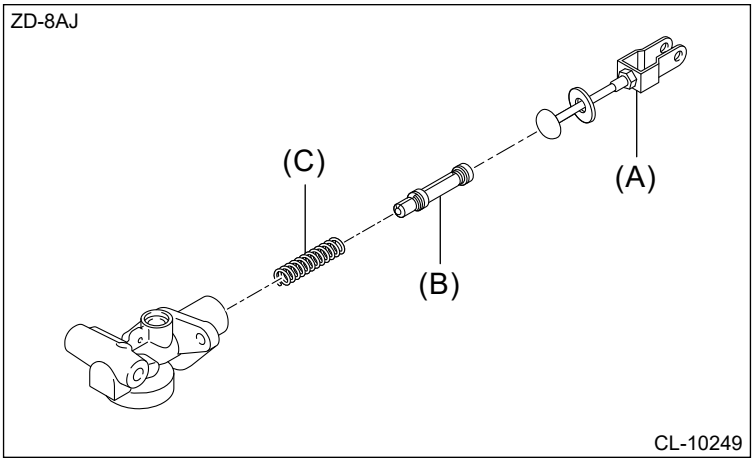


6. Remove the snap ring (A).



7. Remove the push rod, piston, and spring.

Caution:
Be careful not to scratch the inside of master cylinder.

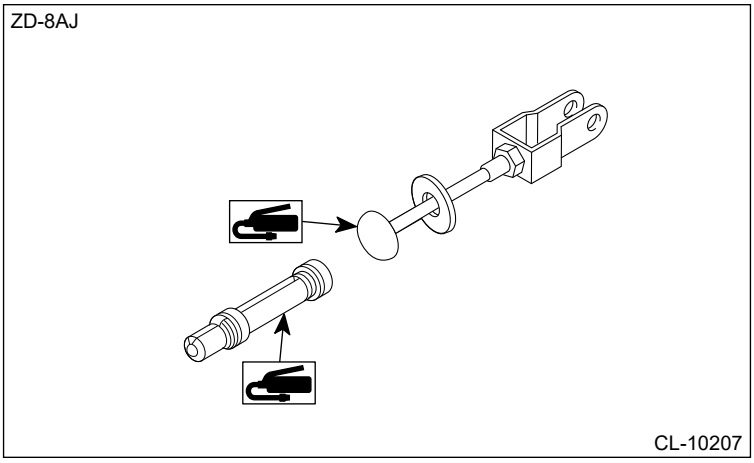


(A) Push rod (B) Piston (C) Spring

CLUTCH SYSTEM > Master Cylinder

ASSEMBLY

1. Apply grease to the area shown in the figure.
   Preparation items:
   Grease: Silicone grease G-40M or equivalent



2. Install the spring, piston, and push rod.
   Caution:
   Be careful not to scratch the inside of master cylinder.
3. Install the snap ring.
4. Install the seal reservoir.
5. Install the reservoir tank.
6. Use a pin punch and a hammer to install the pin.
7. Install the reservoir tank cap.
8. Install the clutch hose and clutch pipe. Ref. to CLUTCH SYSTEM>Clutch Pipe and Hose>INSTALLATION.

CLUTCH SYSTEM > Master Cylinder

INSPECTION

1. Check for clutch fluid leaks.
2. Check that there is no deformation, cracks or other damages.
3. Check for excessive rusting.

CLUTCH SYSTEM > Operating Cylinder

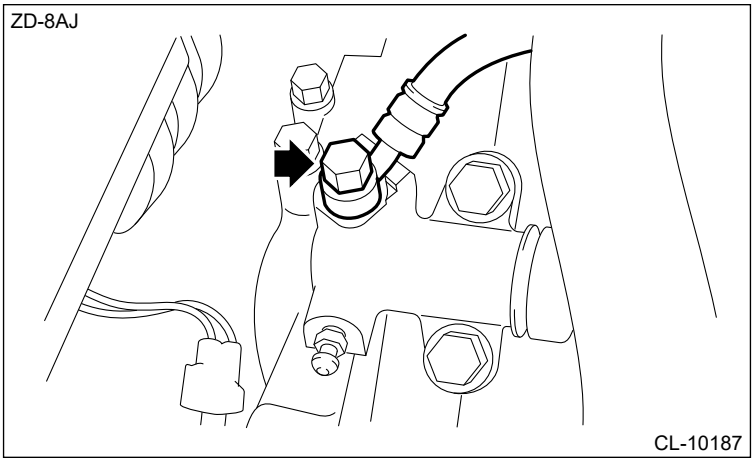
REMOVAL

Caution:
Do not let clutch fluid come into contact with the painted surface of the vehicle.
Wash away with water immediately and wipe off if it is spilled by accident.

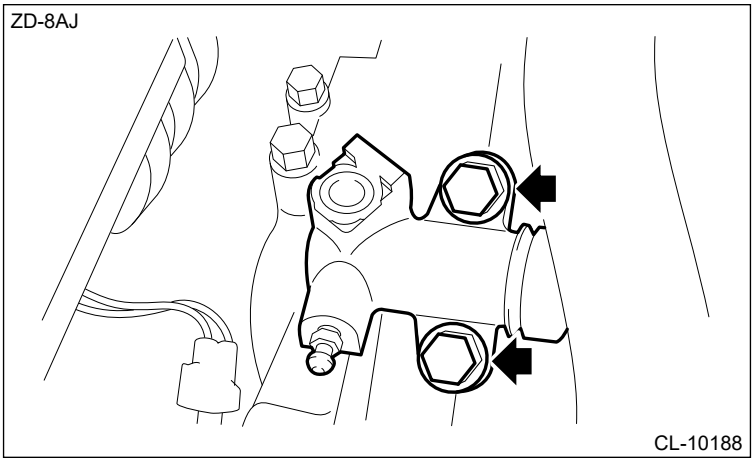
Note:
The operating cylinder cannot be disassembled.

1. Disconnect the clutch hose from the operating cylinder.

Note:
Prepare the container for collecting the clutch fluid.



2. Remove the operating cylinder.



CLUTCH SYSTEM > Operating Cylinder

INSTALLATION

1. Install the operating cylinder.

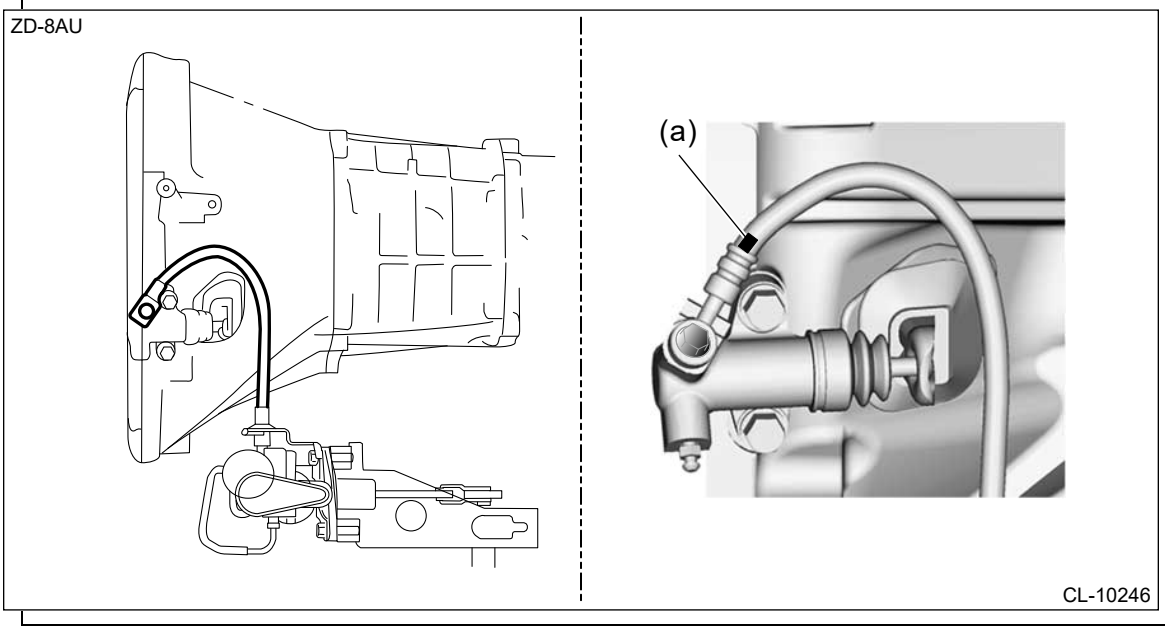
Tightening torque:

37 N·m (3.8 kgf-m, 27.3 ft-lb)

2. Using a new gasket, connect the clutch hose.

Note:

- **Install the clutch hose while making sure that it hangs loose to the rear of the vehicle.**
- **Face the mark (a) of the clutch hose in the top direction.**



Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)

3. Bleed air from the clutch fluid. Ref. to CLUTCH SYSTEM>Air Bleeding>PROCEDURE.

CLUTCH SYSTEM > Operating Cylinder

INSPECTION

1. Check for clutch fluid leaks.
2. Check that there is no deformation, cracks or other damages.
3. Check for excessive rusting.

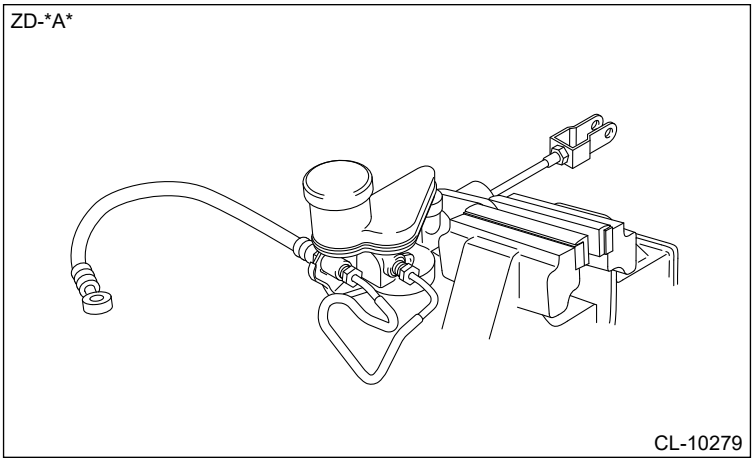
CLUTCH SYSTEM > Clutch Pipe and Hose

REMOVAL

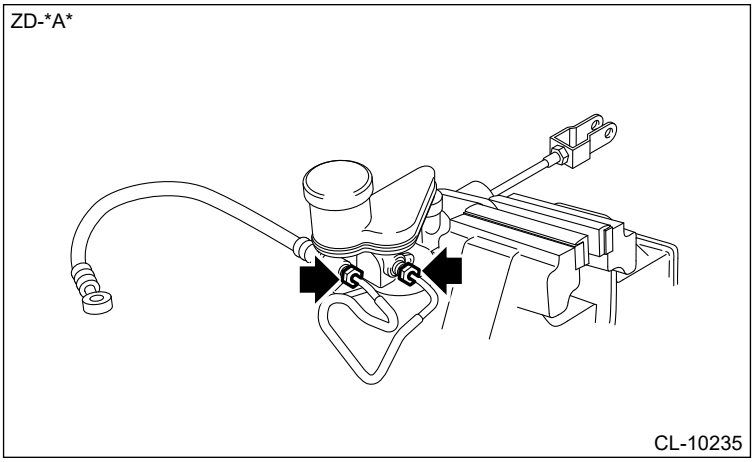
Caution:
- **Do not let clutch fluid come into contact with the painted surface of the vehicle. Wash away with water immediately and wipe off if it is spilled by accident.**
- **Remove the master cylinder, hose bracket, clutch pipe, and clutch hose as a unit. If you remove the clutch pipe and clutch hose with the master cylinder installed to the vehicle, the clutch hose bracket may get deformed.**

1. Remove the master cylinder. Ref. to CLUTCH SYSTEM>Master Cylinder>REMOVAL.
2. Using a vise, secure the master cylinder.

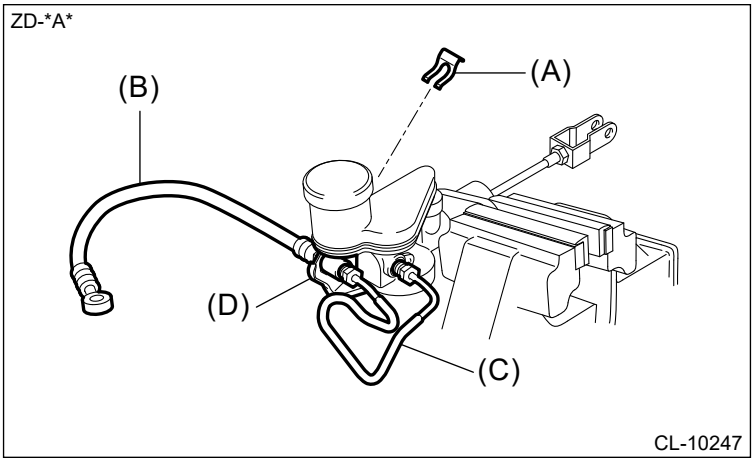
Caution:
- **Place aluminum plates or wooden pieces between the contacting surfaces between the vise and the master cylinder to prevent master cylinder damage.**
- **Be careful not to clamp the cylinder portion as that can cause the master cylinder to get deformed.**



3. Loosen the clutch pipe nut.



4. Remove the clip (A), clutch hose (B), clutch pipe (C), and hose bracket (D).



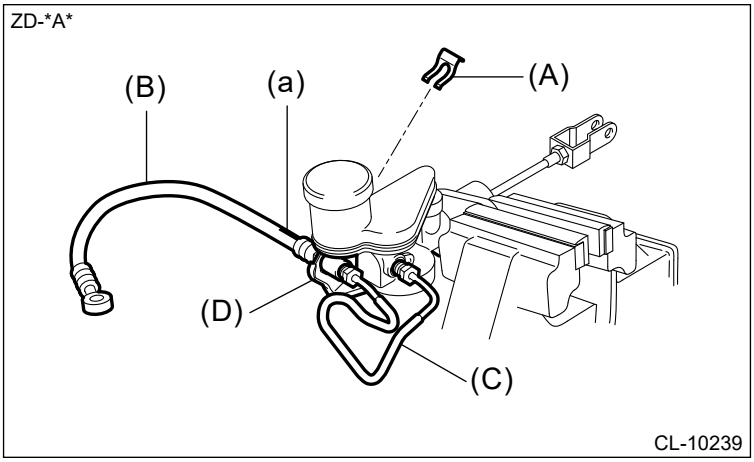
CLUTCH SYSTEM > Clutch Pipe and Hose

INSTALLATION

Caution:
Install the master cylinder, hose bracket, clutch pipe, and clutch hose as a unit.
If you install the clutch pipe and clutch hose with the master cylinder installed to the vehicle, the clutch hose bracket may get deformed.

1. Install the clip (A), clutch pipe (B), clutch hose (C), and hose bracket (D).

Note:
Face the mark (a) of the clutch hose upward and backward at an angle.

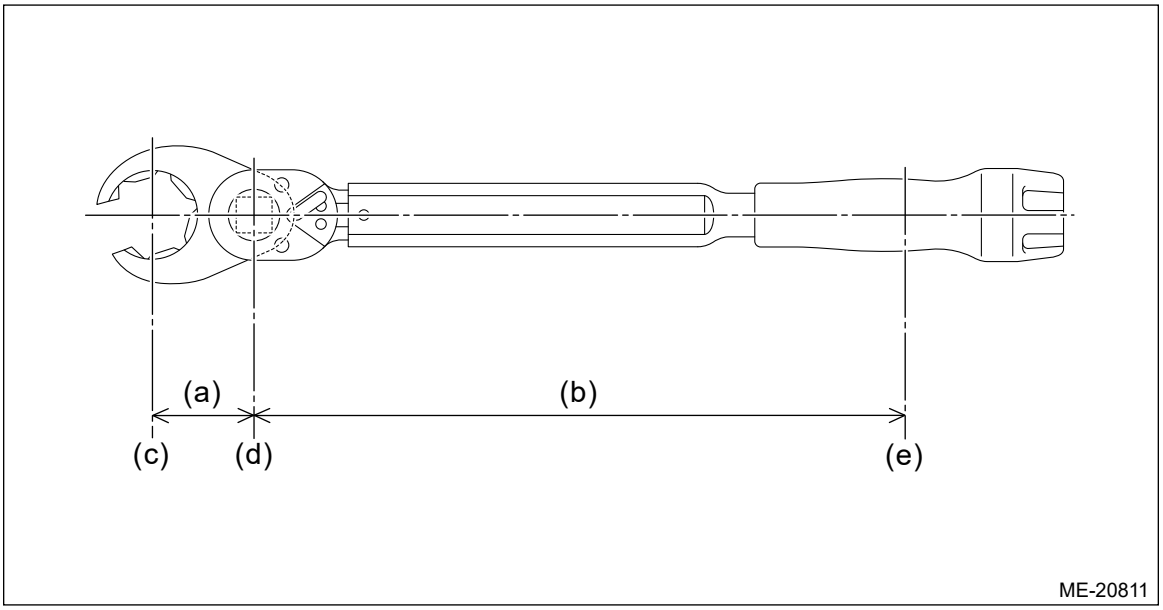


2. Use a crowfoot wrench to tighten the clutch pipe nut.

Tightening torque:

Calculation formula
T = 15.5 N·m (1.6 kgf-m, 11.4 ft-lb) × L1/ (L1 + L2)
T: Reading of the torque wrench L1: Effective length of the torque wrench L2: Effective length of the crowfoot wrench

Note:
If the effective length of the tool used is unknown, consult the manufacturer of the tool.



(a) Effective length of the crowfoot wrench (L2)
(b) Effective length of the torque wrench (L1)
(c) Center of the open end of crowfoot wrench
(d) Center of drive square of the torque wrench
(e) Center of the position where a force is applied by hand

CLUTCH SYSTEM > Clutch Pipe and Hose

INSPECTION

1. Check for clutch fluid leaks.
2. Check that there is no deformation, cracks or other damages.
3. Check for excessive rusting.

CLUTCH SYSTEM > Clutch Fluid

INSPECTION

Caution:
- **Do not let clutch fluid come into contact with the painted surface of the vehicle. Wash away with water immediately and wipe off if it is spilled by accident.**
- **Do not mix different kinds of clutch fluid.**
- **Do not allow water or foreign matter to enter the reservoir tank.**
- **Always use new clutch fluid when replacing or refilling the clutch fluid.**

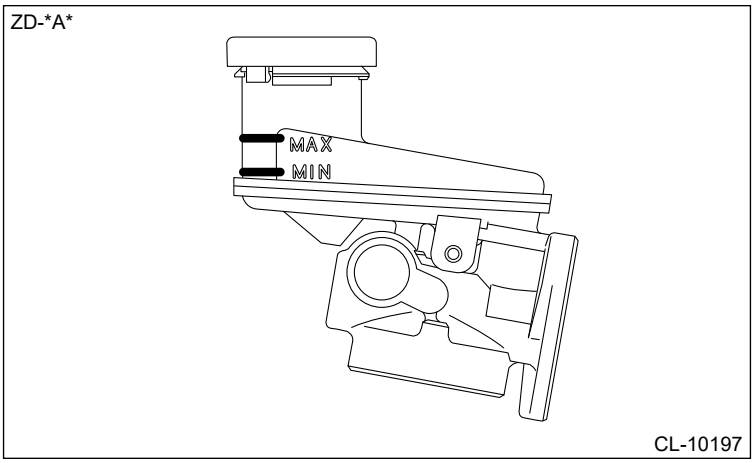
1. Park the vehicle on a level surface.
2. Check the clutch fluid for any significant discoloration.
3. Check that the clutch fluid level is between "MIN" and "MAX".

Caution:
When using a tool such as a dropper to adjust the fluid amount, do not use one that has been utilized for deteriorated clutch fluid or other liquids.
Doing so may cause the sealing parts or clutch fluid to deteriorate, resulting in a malfunction.

Note:
If it is necessary to add the fluid, make sure that there are no clutch fluid leaks.

Preparation items:

Clutch fluid: Ref. to CLUTCH SYSTEM>General Description>SPECIFICATION > CLUTCH FLUID.



CLUTCH SYSTEM > Clutch Fluid

REPLACEMENT

For the clutch fluid replacement procedure, refer to "Air Bleeding". Ref. to CLUTCH SYSTEM>Air Bleeding>PROCEDURE.

CLUTCH SYSTEM > Air Bleeding

PROCEDURE

Caution:

- **Do not let clutch fluid come into contact with the painted surface of the vehicle. Wash away with water immediately and wipe off if it is spilled by accident.**
- **Do not mix different kinds of clutch fluid.**
- **Cover the bleeder plug with cloth to prevent clutch fluid from being splashed on surrounding parts when loosening the plug.**
- **Do not allow water or foreign matter to enter the reservoir tank.**
- **Always use new clutch fluid when replacing or refilling the clutch fluid.**
- **During the operation, replenish the clutch fluid to keep its level at "MIN" or higher at all times and to prevent entry of air.**
- **After the operation, wipe off any clutch fluid around the bleeder plug and reservoir tank.**

Note:

For convenience and safety, perform the work with 2 people.

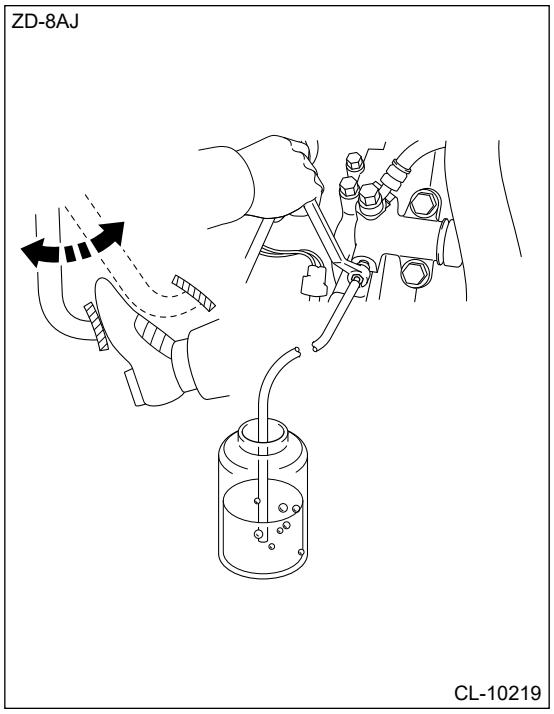
1. Remove the reservoir tank cap.
2. Replenish the clutch fluid.

   Preparation items:

   Clutch fluid: Ref. to CLUTCH SYSTEM>General Description>SPECIFICATION > CLUTCH FLUID.
3. Connect a transparent vinyl tube or a similar tool to the bleeder plug of the operating cylinder.

   Note:

   Prepare the container for collecting the clutch fluid.



4. Depress the clutch pedal several times, and hold it.
5. Loosen the bleeder plug, and drain the clutch fluid.

Note:
Depress the clutch pedal and hold it until you tighten the bleeder plug.

6. Tighten the bleeder plug.

Note:
After draining the clutch fluid, tighten the bleeder plug immediately.

7. Repeat steps 4 to 6, until there are no more air bubbles.
8. Tighten the bleeder plug.

Tightening torque:
7.8 N·m (0.8 kgf-m, 5.8 ft-lb)

9. Depress the clutch pedal 10 times or more.

Caution:
Be sure to perform the operation before starting the engine.

10. Check for clutch fluid leaks.
11. Check the clutch fluid amount. Ref. to CLUTCH SYSTEM>Clutch Fluid>INSPECTION.
12. Perform the road test to make sure there is no fault.

CLUTCH SYSTEM > Clutch Pedal

REMOVAL

For the clutch pedal removal procedure, refer to "Brake Pedal". Ref. to BRAKE>Brake Pedal>REMOVAL.

CLUTCH SYSTEM > Clutch Pedal

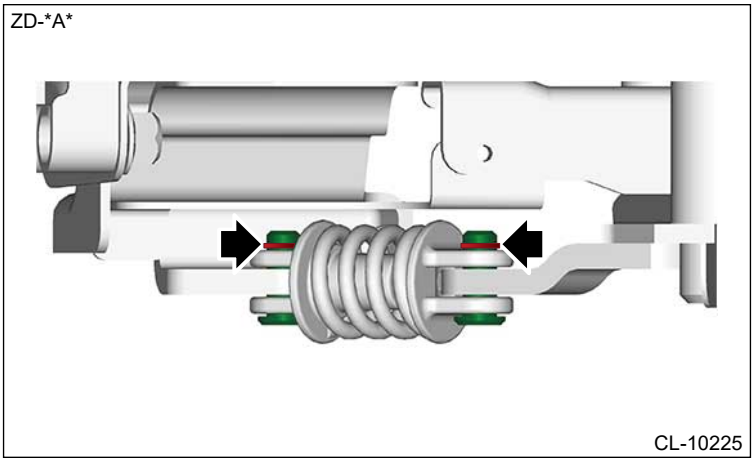
INSTALLATION

For the clutch pedal installation procedure, refer to "Brake Pedal". Ref. to BRAKE>Brake Pedal>INSTALLATION.

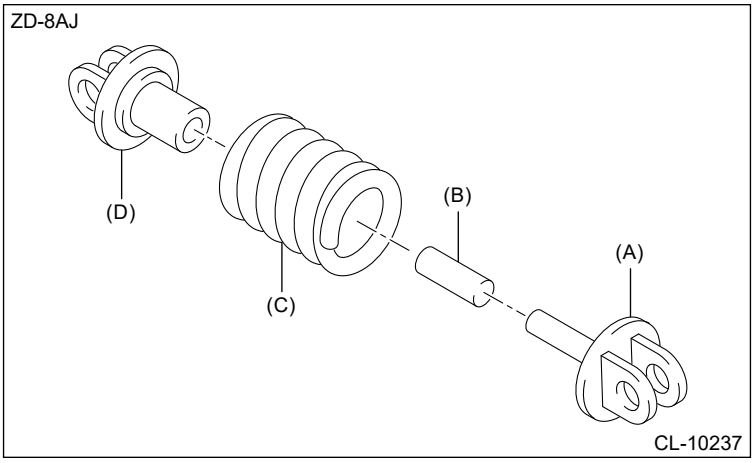
CLUTCH SYSTEM > Clutch Pedal

DISASSEMBLY

1. Remove the clutch switches. Ref. to CLUTCH SYSTEM>Clutch Switch>REMOVAL.
2. Remove the clutch start switch. Ref. to CLUTCH SYSTEM>Clutch Switch>REMOVAL.
3. Remove the clip and assist pin, and remove the assist spring assembly.

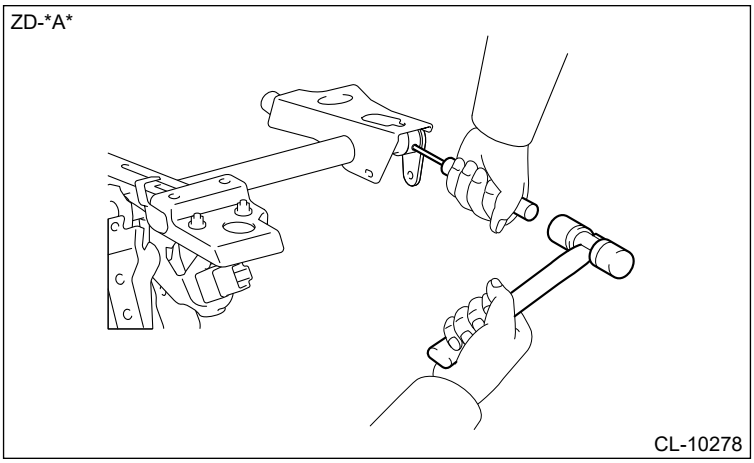


4. Disassemble the assist rod A, assist rod B, assist spring, and assist bushing.

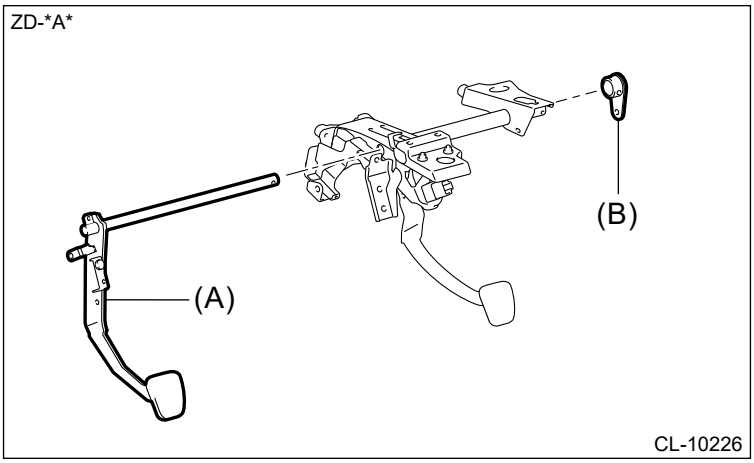


(A) Assist rod A
(C) Assist spring
(D) Assist rod B
(B) Assist bushing

5. Use a pin punch and a hammer to remove the spring pin.

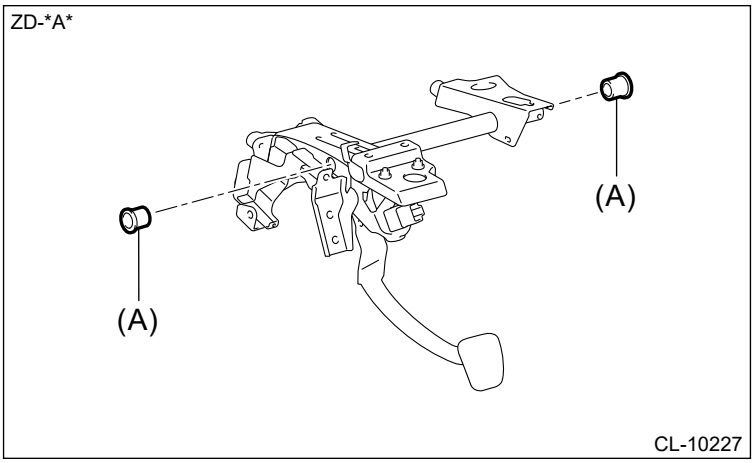


6. Remove the clutch pedal and master cylinder lever.



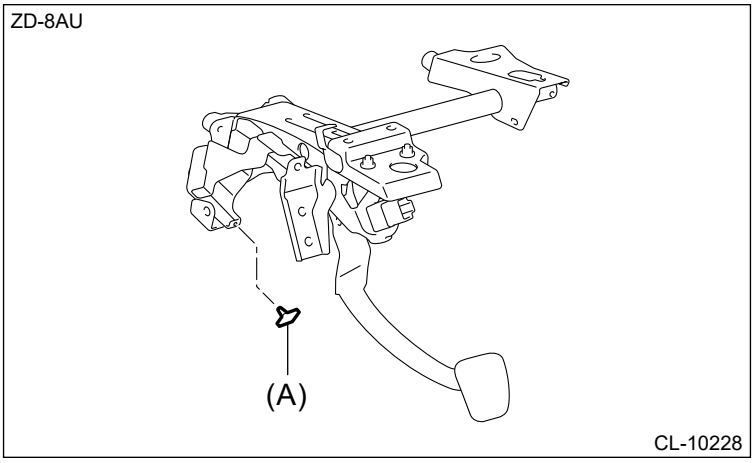
(A) Clutch pedal
(B) Master cylinder lever

7. Remove the clutch pedal bushings.



(A) Clutch pedal bushing

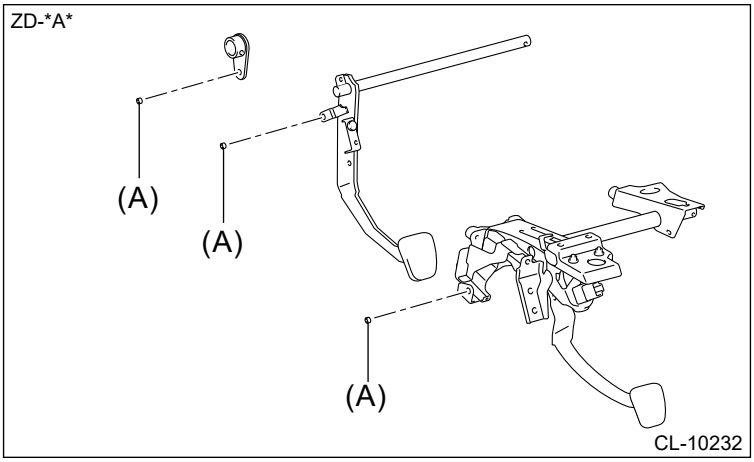
8. Remove the clutch pedal stopper A.



(A) Clutch pedal stopper A

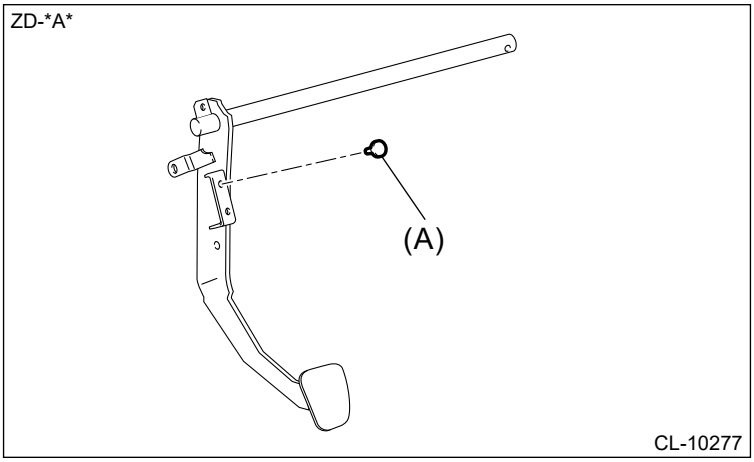
9. Remove the bushings.

Note:
Perform this procedure only when required.



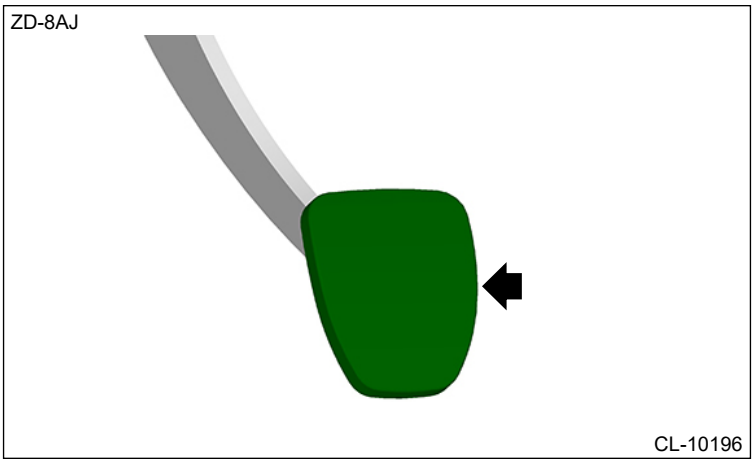
(A) Bushing

10. Remove the clutch pedal stopper B.



(A) Clutch pedal stopper B

11. Remove the pedal pad.



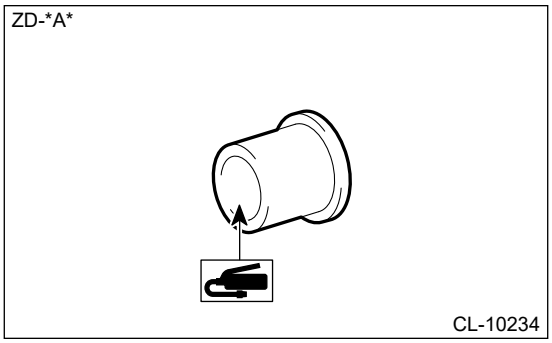
CLUTCH SYSTEM > Clutch Pedal

ASSEMBLY

1. Install the pedal pad.
2. Install the clutch pedal stopper B.
3. Install the bushing.
4. Install the clutch pedal stopper A.
5. Apply grease to the inner periphery of the clutch pedal bushing.

   Preparation items:

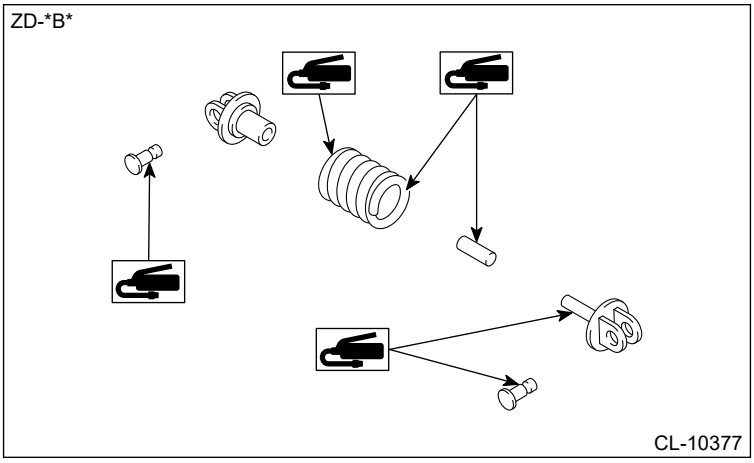
   Grease: NIPPON GREASE NIGTIGHT LTS No. 2 or equivalent



6. Install the clutch pedal bushing.
7. Set the clutch pedal and master cylinder lever.
8. Use a pin punch and a hammer to install the spring pin.
9. Apply grease to the sliding surfaces of the assist rod A, assist rod B, assist bushing, assist spring, and assist pin.

   Preparation items:

   Grease: NIPPON GREASE NIGTIGHT LTS No. 2 or equivalent



10. Assemble the assist rod A, assist rod B, assist spring and assist bushing.

11. Set the assist spring assembly, and then install the assist pin and clip.

Caution:
Always use a new clip.

12. Install the clutch start switch. Ref. to CLUTCH SYSTEM>Clutch Switch>INSTALLATION.

13. Install the clutch switch. Ref. to CLUTCH SYSTEM>Clutch Switch>INSTALLATION.

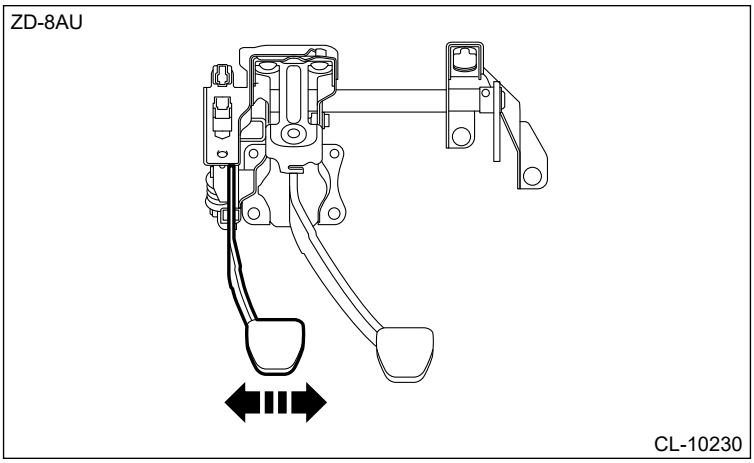
CLUTCH SYSTEM > Clutch Pedal

INSPECTION

1. Check that there is no deformation, cracks or other damages.

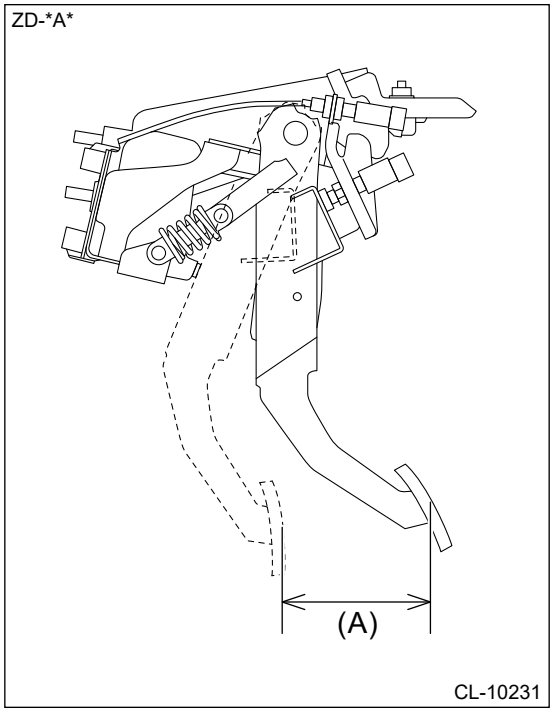
2. Shake the clutch pedal in the lateral direction with a force of approximately 10 N (1.0 kgf, 2.2 lbf) to check the clutch pedal play.

Service limit:
4.0 mm (0.16 in)



3. Check the full stroke (A) of the clutch pedal.

Specification:
115 — 120 mm (4.5 — 4.7 in)



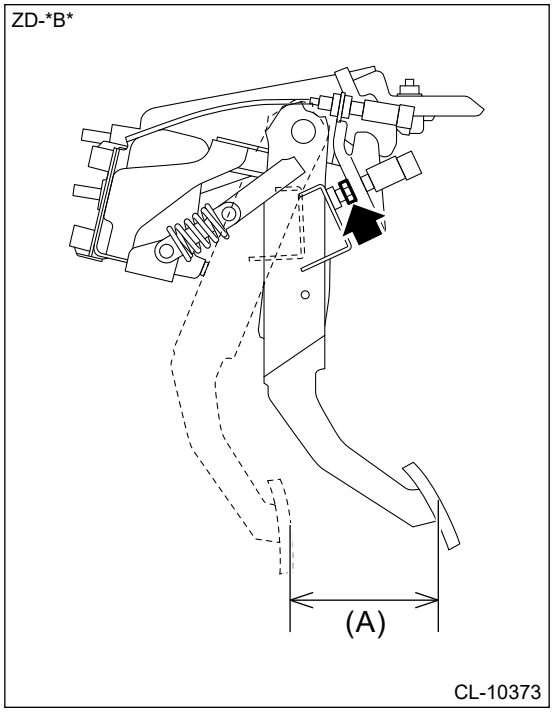
CLUTCH SYSTEM > Clutch Pedal

ADJUSTMENT

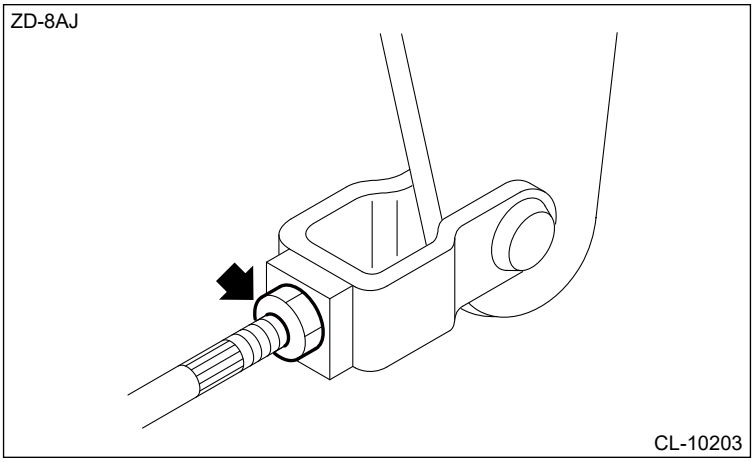
Caution:
- **When adjusting the full stroke of the clutch pedal, do not turn the clutch switch.**
- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**

Note:
If the clutch switch cannot adjust the full stroke of the clutch pedal within the specified value, adjust the length of the push rod.

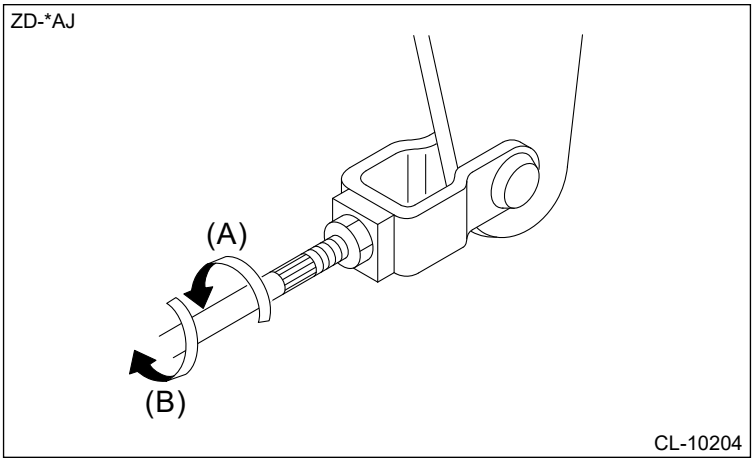
1. Disconnect the ground terminal from the battery sensor, and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover LWR driver INN and cover LWR driver OUT. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. When using the clutch switch for adjustment
   (1) Loosen the clutch switch nut.
   (2) Adjust the full stroke (A) of the clutch pedal.
   Specification:
   115 — 120 mm (4.5 — 4.7 in)
   (3) Tighten the nut of the clutch switch.
   Tightening torque:
   8 N·m (0.8 kgf-m 5.9 ft-lb)



4. When adjusting the length of the push rod
(1) Loosen the push rod nut.

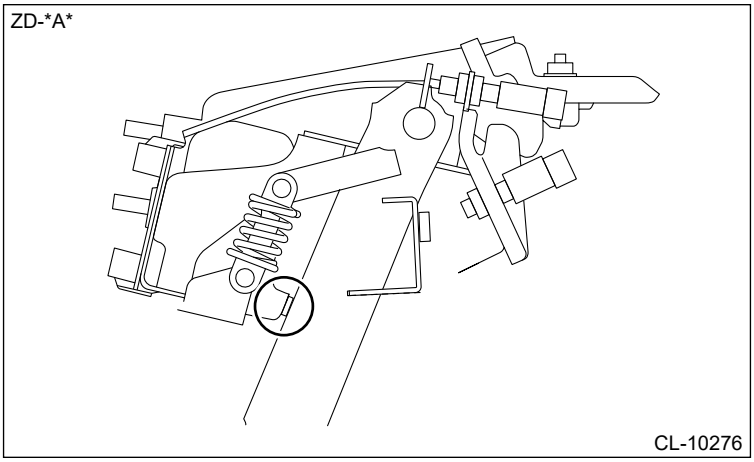


(2) Adjust the length of the push rod to change the stroke.

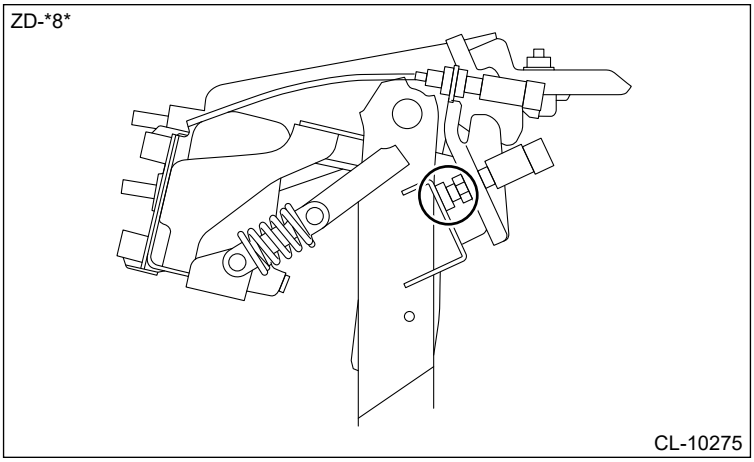


(A) In the longer direction (increasing the stroke)
(B) In the shorter direction (decreasing the stroke)

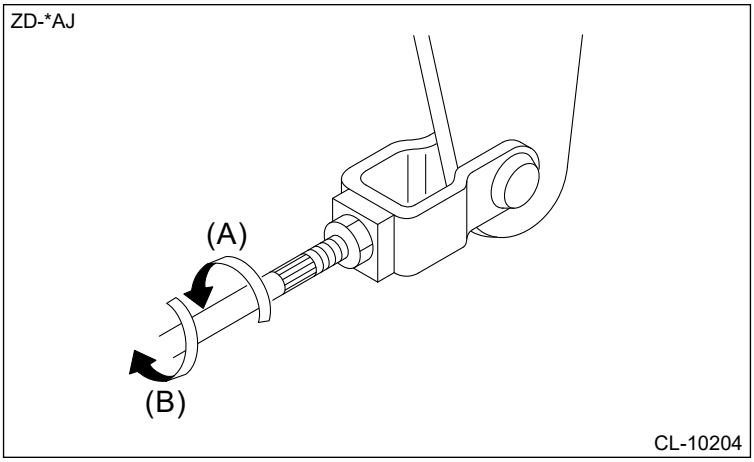
(3) Make sure that the clutch pedal contacts the clutch pedal stopper A when the clutch pedal is at the full stroke position.



(4) Check that the clutch pedal contacts the clutch switch side when the clutch pedal is released.



(5) Turn the push rod in the shorter direction until a clearance is created on the clutch switch side.
(6) Turn the push rod in the longer direction until the clutch pedal contacts the clutch switch.
(7) Turn in the direction that will shorten the push rod by 270°.



(A) In the longer direction (B) In the shorter direction

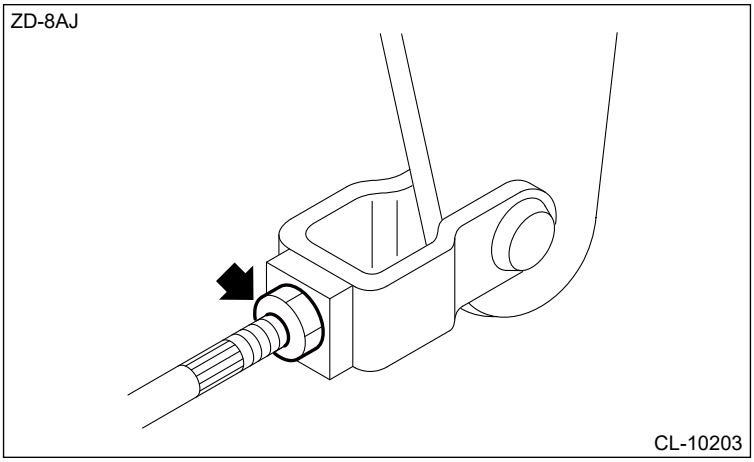
(increasing the stroke) (decreasing the stroke)

(8) Check that the clevis pin moves smoothly by moving it in the left and right directions.

(9) Tighten the push rod nut.

Tightening torque:

10 N·m (1.0 kgf-m, 7.4 ft-lb)



(10)Depress and release the clutch pedal two or three times to ensure that the clutch pedal and release lever operate smoothly.

(11)Inspect the full stroke of the clutch pedal again.

Specification:

115 — 120 mm (4.5 — 4.7 in)

5. Install the cover LWR driver INN and cover LWR driver OUT. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>INSTALLATION.

6. Connect the ground terminal to battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

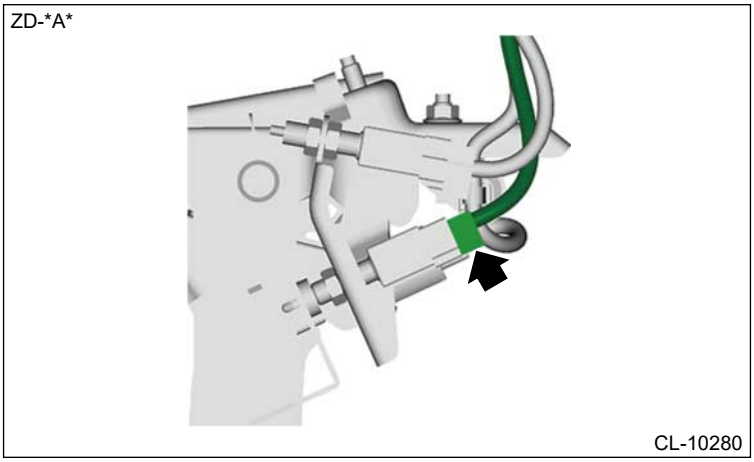
CLUTCH SYSTEM > Clutch Switch

REMOVAL

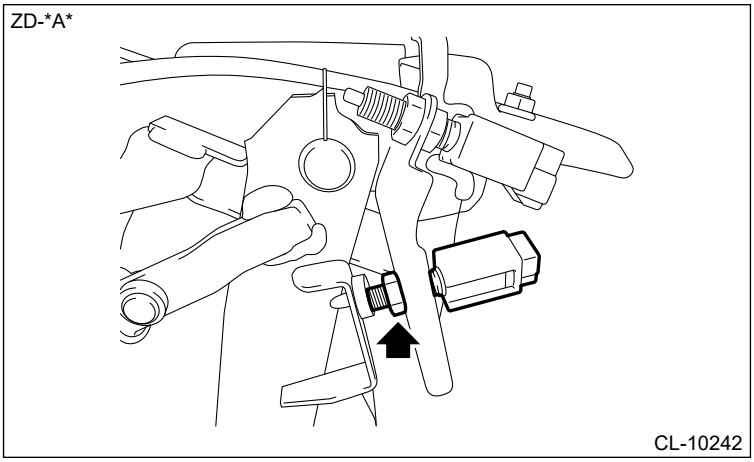
Caution:
Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. CLUTCH SWITCH

1. Disconnect the ground terminal from the battery sensor, and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover LWR driver INN and cover LWR driver OUT. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Disconnect the connector.



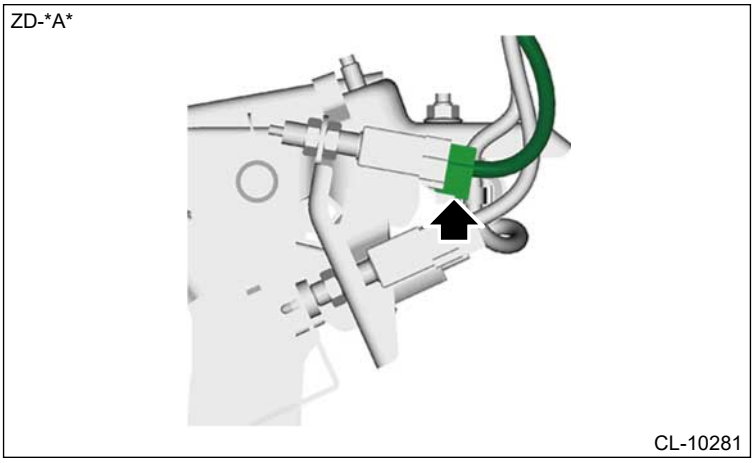
4. Remove the clutch switches.



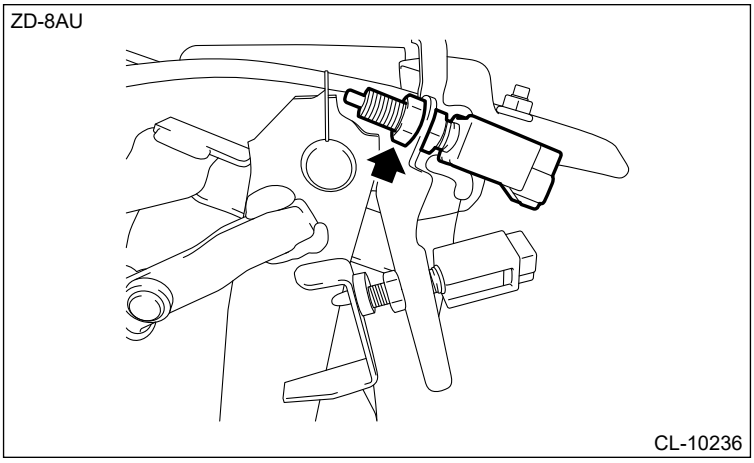
2. CLUTCH START SWITCH

1. Disconnect the ground terminal from the battery sensor, and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover LWR driver INN and cover LWR driver OUT. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.

3. Disconnect the connector.



4. Remove the clutch start switch.



CLUTCH SYSTEM > Clutch Switch

INSTALLATION

1. CLUTCH SWITCH

1. Temporarily install the clutch switch.
2. Adjust the full stroke of the clutch pedal. Ref. to CLUTCH SYSTEM>Clutch Pedal>ADJUSTMENT.
3. Connect the connector.
4. Install the cover LWR driver INN and cover LWR driver OUT. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>INSTALLATION.
5. Connect the ground terminal to battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
6. Carry out an operation inspection for the clutch switch. Ref. to CLUTCH SYSTEM>Clutch Switch>INSPECTION.

2. CLUTCH START SWITCH

1. Temporarily install the clutch start switch.
2. Adjust the amount of protrusion for the clutch start switch. Ref. to CLUTCH SYSTEM>Clutch Switch>ADJUSTMENT.
3. Connect the connector.

4. Install the cover LWR driver INN and cover LWR driver OUT. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>INSTALLATION.
5. Connect the ground terminal to battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
6. Carry out an operation inspection for the clutch start switch. Ref. to CLUTCH SYSTEM>Clutch Switch>INSPECTION.

CLUTCH SYSTEM > Clutch Switch

INSPECTION

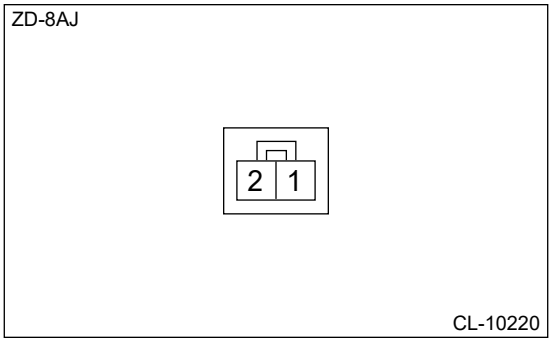
1. CLUTCH SWITCH

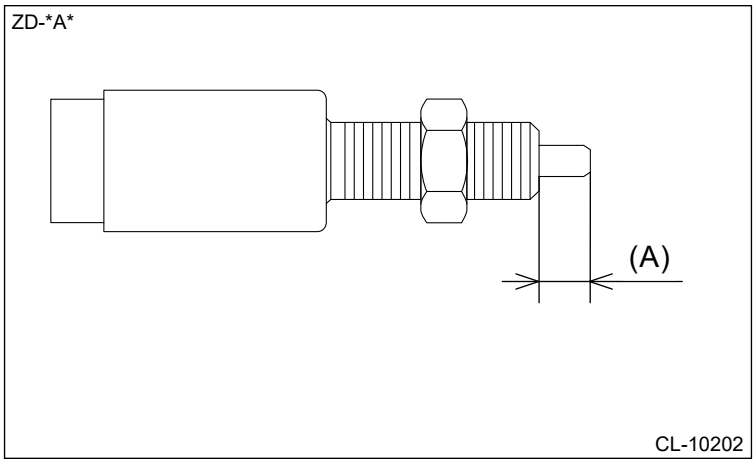
CHECK OPERATION

1. Check that engine does not start with the clutch pedal not depressed.
2. Check that engine starts with the clutch pedal fully depressed.

UNIT INSPECTION

1. Check that there is no deformation, cracks or other damages.
2. Measure the resistance between switch terminals.





Terminal No.:

1 — 2

Judgment standards:

When section (A) is 5.0 — 6.5 mm (0.20 — 0.26 in) long, it turns ON ←→ OFF.

Resistance value:

ON: Less than 1 Ω

OFF: 1 MΩ or more

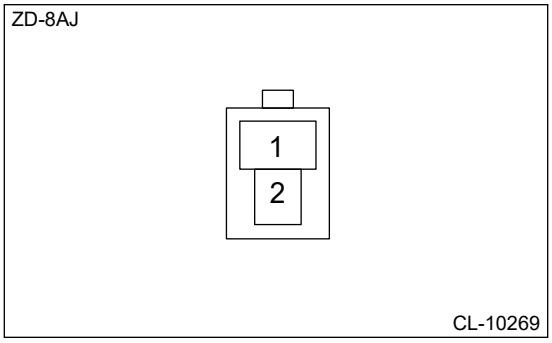
2. CLUTCH START SWITCH

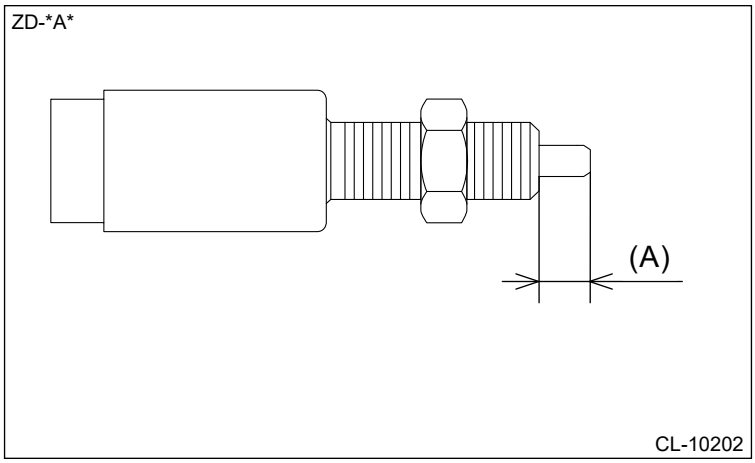
CHECK OPERATION

1. Check that engine does not start with the clutch pedal not depressed.
2. Check that engine starts with the clutch pedal fully depressed.

UNIT INSPECTION

1. Check that there is no deformation, cracks or other damages.
2. Measure the resistance between switch terminals.





Terminal No.:

1 — 2

Judgment standards:

When section (A) is 4.0 — 5.5 mm (0.16 — 0.22 in) long, it turns ON ←→ OFF.

Resistance value:

ON: Less than 1 Ω

OFF: 1 MΩ or more

CLUTCH SYSTEM > Clutch Switch

ADJUSTMENT

Caution:

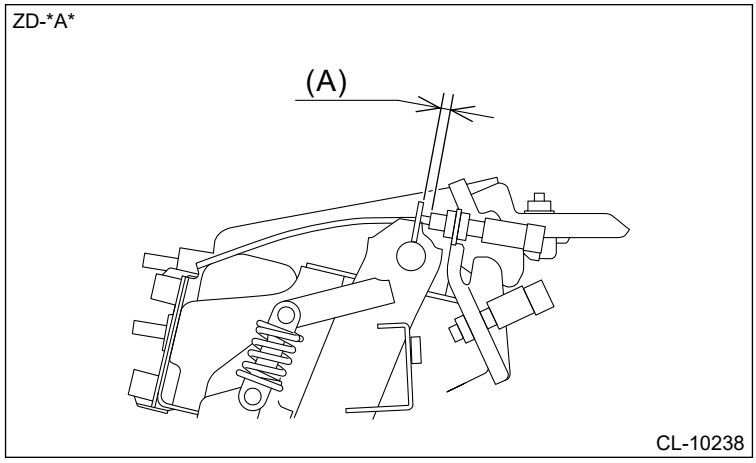
Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". **Ref. to AIRBAG SYSTEM>General Description>CAUTION.**

1. CLUTCH SWITCH

For the clutch switch adjustment procedure, refer to “Clutch Pedal”. Ref. to CLUTCH SYSTEM>Clutch Pedal>ADJUSTMENT.

2. CLUTCH START SWITCH

1. Disconnect the ground terminal from the battery sensor, and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover LWR driver INN and cover LWR driver OUT. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Loosen the nut.
4. Fully depress the clutch pedal and hold it. Next, adjust the amount of protrusion (A) for the clutch start switch.
   Specification:
   3.5 — 4.0 mm (0.14 — 0.16 in)



5. Tighten the nut.
   Tightening torque:
   8 N·m (0.8 kgf-m, 5.9 ft-lb)
6. Install the cover LWR driver INN and cover LWR driver OUT. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>INSTALLATION.
7. Connect the ground terminal to battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

CLUTCH SYSTEM > Symptoms and causes

INSPECTION

Symptoms	Problem parts etc.	Possible cause
The engine speed rises but the vehicle cannot accelerate. (The clutch slips.)	Clutch disc	Clutch disc wear, seizure, or oil contamination
	Clutch cover	Diaphragm spring damage or fatigue
	Flywheel	Flywheel distortion, seizure, or oil contamination
	Clutch pedal	Improper stroke adjustment
The clutch does not disengage.	Clutch disc	Clutch disc misalignment, runout, facing surface damage, dirt, seizure, oil contamination, or improper spline portion lubrication
	Clutch cover	Diaphragm spring damage or fatigue
	Master cylinder	Faulty master cylinder
	Operating cylinder	Faulty operating cylinder
	Clutch fluid	Air entry in fluid
	Clutch pipe	Clutch fluid leaks or clogs
	Clutch hose	Clutch fluid leaks or clogs
	Clutch pedal	Improper stroke adjustment
Vibrations occur when the clutch is engaged.	Clutch disc	Clutch disc runout, oil contamination, wear, or damage
	Clutch cover	Uneven diaphragm spring height
	Flywheel	Flywheel distortion, uneven wear, or seizure
	Transmission rear crossmember	Loose transmission rear crossmember
Noise is emitted.	Release bearing	Release bearing wear, dirt, or damage
	Pilot bearing	Pilot bearing wear, dirt, or damage
	Clutch disc	Clutch disc damage
	Release lever	Improper release lever lubrication
It is difficult to change gears.	Clutch disc	Faulty clutch disc
	Clutch cover	Diaphragm spring damage or uneven height
	Master cylinder	Faulty master cylinder

Symptoms	Problem parts etc.	Possible cause
	Operating cylinder	Faulty operating cylinder
	Clutch fluid	Air entry in fluid
	Clutch pipe	Clutch fluid leaks or clogs
	Clutch hose	Clutch fluid leaks or clogs
	Clutch pedal	Improper stroke adjustment
The clutch does not engage.	Clutch disc	Clutch disc misalignment, runout, facing surface damage, dirt, seizure, oil contamination, or improper spline portion lubrication
	Clutch cover	Diaphragm spring damage or uneven height
	Master cylinder	Faulty master cylinder
	Operating cylinder	Faulty operating cylinder
	Clutch fluid	Air entry in fluid
	Clutch pipe	Clutch fluid leaks or clogs
	Clutch hose	Clutch fluid leaks or clogs
	Clutch pedal	Improper stroke adjustment
Clutch pedal is not responsive when depressed.	Master cylinder	Faulty master cylinder
	Operating cylinder	Faulty operating cylinder
	Clutch fluid	Air entry in fluid
	Clutch pipe	Clutch fluid leaks
	Clutch hose	Clutch fluid leaks
	Clutch cover	Diaphragm spring damage